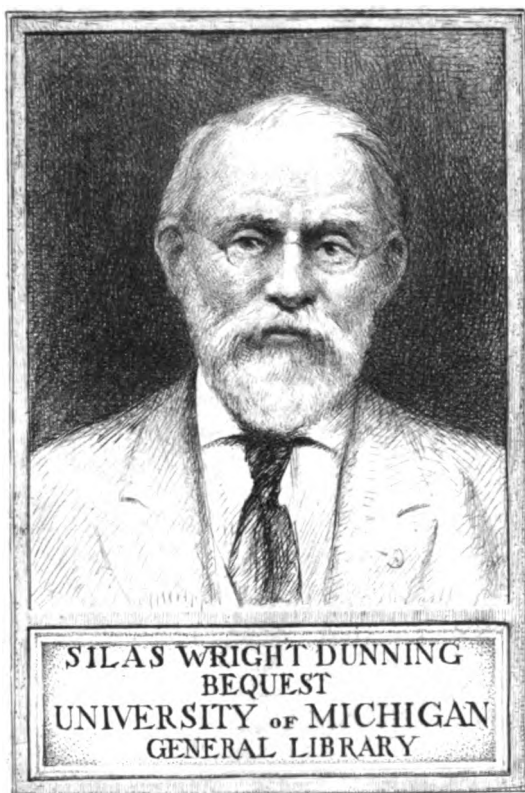

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Journal of the United Service Institution of India.

Vol. XXXVII—1908.

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THE JOURNAL

OF THE

United Service Institution of India.

Vol. XXXVII.

January 1908.

No. 170.

ESSAY ADJUDGED SECOND IN THE GOLD MEDAL
COMPETITION, 1907.

**The use of entrenchments and field fortification in the attack,
as exemplified by recent wars ; together with sugges-
tions concerning the nature, distribution and carriage of
entrenching tools.**

BY MAJOR H. F. THULLIER, R.E.

MOTTO :—" *Vincit amor patriæ.*"

The subject of this essay, the use of field fortification in the attack, is often treated as if it were a new feature, which has arisen only in quite recent times and owed its development to the adoption of modern rapid fire weapons. Yet even a cursory glance over the pages of the military history of the nineteenth century will show that this is by no means the case. Those who have studied the Russo-Turkish War of 1877-78 will remember how Skobelev's gallant battalions, when clinging to the bare slopes of the Green Hills, used their bayonets, mess tins and hands to throw up a rough cover against the fire of the Turkish defenders of the redoubts on the south side of Plevna. It will be remembered also how in the later phases of the same war the Russians, having learnt from their adversaries the power that field entrenchments confer, used them systematically in their attacks ; Skobelev to this end going so far even as to equip every man in his division with an entrenching tool.

Going further back we find in the records of the later phases of the American Civil War numerous examples of the use of fortification in the attack by both combatants. Whole campaigns were fought behind entrenchments and breastworks, and every furlong of ground gained was at this period instantly made good by this means.

Nor was this even the first appearance of this form of warfare. Searching the history of yet more distant times we find it employed even in the Peninsula War, where Wellington's battalions in their conquering advance through the north of Spain to the crowning victory of Vittoria are said to have been in the habit of securing by entrenchment each position gained in their advance.

With nearly every nation the lessons of war seem to be almost invariably forgotten in the ensuing years of peace, and the same problems that are successfully overcome by one generation have to be solved again through the bitter and bloody experience of their successors. To no branch of the military art does this apply more than to the subject under review. At the beginning of every campaign we find that the teachings of peace time theory have allowed the officers to forget the power that is conferred by entrenchments, and that the rank and file, untrained in the practice of this art, look upon it as an unnecessary and even degrading labour. "We came out to fight battles, not to dig trenches," said the American soldiers of 1861, but by 1864 they had learned that digging trenches is a necessary prelude to winning battles. Similarly in other protracted campaigns the leaders have awoken to the indispensability of field fortification, and the soldiers have come to realize that their lives and their chances of success often depend on the protection it affords.

Thus again, notwithstanding the ample records available in the annals of the Civil War, and the further evidence afforded in the Russo-Turkish War of 1877-78, we find in the beginning of the struggle in South Africa that the British troops made their attacks without availing themselves of this powerful auxiliary. It was not till after the failures at Colenso and Vaal Kranz that the troops in Natal began on the slopes of Pieters Hill to throw up rough entrenchments during their attack; and on the western theatre of war the first instance of its use was the approach to the Boer position at Paardeburg.

In the war in Manchuria the Russians, notwithstanding their own experiences in 1878, failed to make use of fortification in offensive operations. Even the Japanese failed to realise at the beginning of the war the value of this adjunct to the attack, and delivered their assaults at Nanshan in a manner, as will be shown later, very different from those employed at the battles round Liaoyang and Mukden.

Use of entrenchments in the attack in recent wars.

Although the American Civil War can hardly, speaking strictly, be considered recent, yet it may be said to belong to the era of modern tactics, and the use of field fortification in the attack received such a thorough and instructive exemplification in some of its campaigns that it is justifiable to commence our retrospect of this subject by a brief description of its employment at that time.

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Secretary

Simla, 1st August 1907.

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THE JOURNAL

OF THE

United Service Institution of India.

Vol. XXXVII.

January 1908.

No. 170.

ESSAY ADJUDGED SECOND IN THE GOLD MEDAL
COMPETITION, 1907.

**The use of entrenchments and field fortification in the attack,
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tions concerning the nature, distribution and carriage of
entrenching tools.**

By MAJOR H. F. THULLIER, R.E.

MOTTO:—“*Vincit amor patriæ.*”

The subject of this essay, the use of field fortification in the attack, is often treated as if it were a new feature, which has arisen only in quite recent times and owed its development to the adoption of modern rapid fire weapons. Yet even a cursory glance over the pages of the military history of the nineteenth century will show that this is by no means the case. Those who have studied the Russo-Turkish War of 1877-78 will remember how Skobelev's gallant battalions, when clinging to the bare slopes of the Green Hills, used their bayonets, mess tins and hands to throw up a rough cover against the fire of the Turkish defenders of the redoubts on the south side of Plevna. It will be remembered also how in the later phases of the same war the Russians, having learnt from their adversaries the power that field entrenchments confer, used them systematically in their attacks; Skobelev to this end going so far even as to equip every man in his division with an entrenching tool.

Going further back we find in the records of the later phases of the American Civil War numerous examples of the use of fortification in the attack by both combatants. Whole campaigns were fought behind entrenchments and breastworks, and every furlong of ground gained was at this period instantly made good by this means.

Nor was this even the first appearance of this form of warfare. Searching the history of yet more distant times we find it employed even in the Peninsula War, where Wellington's battalions in their conquering advance through the north of Spain to the crowning victory of Vittoria are said to have been in the habit of securing by entrenchment each position gained in their advance.

With nearly every nation the lessons of war seem to be almost invariably forgotten in the ensuing years of peace, and the same problems that are successfully overcome by one generation have to be solved again through the bitter and bloody experience of their successors. To no branch of the military art does this apply more than to the subject under review. At the beginning of every campaign we find that the teachings of peace time theory have allowed the officers to forget the power that is conferred by entrenchments, and that the rank and file, untrained in the practice of this art look upon it as an unnecessary and even degrading labour. "We came out to fight battles, not to dig trenches," said the American soldiers of 1861, but by 1864 they had learned that digging trenches is a necessary prelude to winning battles. Similarly in other protracted campaigns the leaders have awoken to the indispensability of field fortification, and the soldiers have come to realize that their lives and their chances of success often depend on the protection it affords.

Thus again, notwithstanding the ample records available in the annals of the Civil War, and the further evidence afforded in the Russo-Turkish War of 1877-78, we find in the beginning of the struggle in South Africa that the British troops made their attacks without availing themselves of this powerful auxiliary. It was not till after the failures at Colenso and Veld Krantz that the troops in Natal began on the slopes of Pieters Hill to throw up rough entrenchments during their attack, and on the western theatre of war the first instance of its use was the approach to the River position at Paardeburg.

In the war in Manchuria the Russians notwithstanding their own experiences in 1878, failed to make use of fortification in offensive operations. Even the Japanese, too slow to reverse at the beginning of the war the value of this adjunct to the attack, and devoted their efforts at Nanshan in a manner as will be shown later, very different from those employed at the battles of Tientsin, Yung, and Mukden.

The evolution of the modern method of attack.

Although the American Civil War can hardly speaking strictly be considered recent, yet it may be said to belong to the era of modern tactics, and the use of field fortification in the attack received such a thoroughgoing introduction in this campaign that it is impossible to suggest that its establishment in modern warfare is due to this source. It is rather to be ascribed to the European wars of the nineteenth century, and to the lessons of the Crimean War.

The campaign which we will select for the purpose of illustration, as affording perhaps the best example of the matter under discussion, is that of **The Atlanta Campaign.** Altanta in 1864. Throughout this campaign the Northern forces under Major-General Sherman employed aggressive tactics. Seizing the initiative at the very beginning, Sherman retained it, always attacking, though not necessarily delivering frontal assaults, till he had pushed his opponents back 120 miles into the city of Atlanta, beleaguered them there for a month and a half, and cut their last remaining line of communication, so that the Southern leader was forced to abandon the town with its stores and materials, and to cut himself adrift with a greatly reduced force. Throughout these operations the Northerners employed field fortification unremittingly. It has already been mentioned that by 1864 the American soldiers were veterans, knowing the advantage of this auxiliary, knowing too how to employ it. Requiring no orders they instinctively entrenched themselves on every occasion, both in attack and defence. Here is how their leader Sherman himself describes their operations: — "Troops, halting for the night or for battle, faced the enemy; moved forward to ground with a good outlook to the front; stacked arms; gathered logs, stumps, fence rails, anything which would stop a bullet; piled these to their front, and, digging a ditch behind, threw the dirt forward, and made a parapet which covered their persons as perfectly as a granite wall."*

Here we have a model on which we might with advantage train all our soldiers to fight at the present day. It will be noticed later that, allowing for the difference in the power of the weapons employed, and in the nature of the theatre of war, the methods of the Turkish soldiers in 1877 and of the Japanese soldiers in 1904 bore a marked resemblance to the above. Experience teaches the same lessons to all men, whether in Europe, Asia, or America.

Sherman's army very considerably outnumbered that of his opponents. Moreover Johnston, the Confederate leader, adopted from the first an attitude of passive defence behind earthworks, in the vain hope that his adversary would weaken himself by frontal assaults, and so give an opportunity for an attack. Sherman however knew better than to conform to his enemy's plans in this manner. When his army came upon the Confederates in an entrenched position, it would seize and strongly entrench a line approximately parallel, and as close as it was possible to approach to that of the enemy. By vigorous demonstration of rifle and artillery fire from this line the Southerners were held fast to their positions. The Northern trenches would then be extended to one flank or the other, that one being chosen which afforded the best prospect of strategic success. The Southerners were obliged to conform or have their flank overlapped and turned. Covered by these entrenchments in his front, Sherman would mass his reserve

* "Battles and Leaders of the Civil War," Vol. IV, p. 248.

UNITED SERVICE INSTITUTION OF INDIA

October 1908.

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Going further back we find in the records of the later phases of the American Civil War numerous examples of the use of fortification in the attack by both combatants. Whole campaigns were fought behind entrenchments and breastworks, and every furlong of ground gained was at this period instantly made good by this means.

Nor was this even the first appearance of this form of warfare. Searching the history of yet more distant times we find it employed even in the Peninsula War, where Wellington's battalions in their conquering advance through the north of Spain to the crowning victory of Vittoria are said to have been in the habit of securing by entrenchment each position gained in their advance.

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In the war in Manchuria the Russians notwithstanding their own experiences in 1878, failed to make use of fortification in offensive operations. Even the Japanese failed to reverse at the beginning of the war the value of this aid to the attack, and delivered the assaults at Nanshan in a manner as will be shown later very different from those employed at the battles of Taku, Yung and Moupin.

The American Civil War and the use of entrenchment.

Although the American Civil War is hardly a speaking strictly, be considered recent, yet it may be said to belong to the civil modern tactics, and the use of the entrenchment in the attack received such a thorough illustration in the campaign of 1862, that its comparative value is as fully shown as could be desired. It is a subject which has occupied the attention of writers on military strategy.

The campaign which we will select for the purpose of illustration, as affording perhaps the best example of the matter under discussion, is that of **The Atlanta Campaign.** Atlanta in 1864. Throughout this campaign the Northern forces under Major-General Sherman employed aggressive tactics. Seizing the initiative at the very beginning, Sherman retained it, always attacking, though not necessarily delivering frontal assaults, till he had pushed his opponents back 120 miles into the city of Atlanta, beleaguering them there for a month and a half, and cut their last remaining line of communication, so that the Southern leader was forced to abandon the town with its stores and materials, and to cut himself adrift with a greatly reduced force. Throughout these operations the Northerners employed field fortification unremittingly. It has already been mentioned that by 1864 the American soldiers were veterans, knowing the advantage of this auxiliary, knowing too how to employ it. Requiring no orders they instinctively entrenched themselves on every occasion, both in attack and defence. Here is how their leader Sherman himself describes their operations: — "Troops, halting for the night or for battle, faced the enemy: moved forward to ground with a good outlook to the front; stacked arms; gathered logs, stumps, fence rails, anything which would stop a bullet; piled these to their front, and, digging a ditch behind, threw the dirt forward, and made a parapet which covered their persons as perfectly as a granite wall." *

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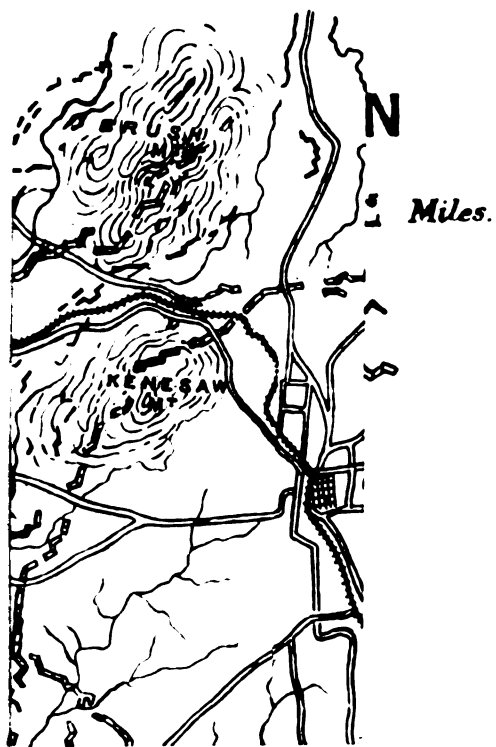
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of fortification in the attack. His training had been in the best of schools, that of three years continuous warfare. As already shown, he knew when to entrench, where to entrench, and how to entrench. The most thorough recognition on the part of an army's leaders of the desirability of employing entrenchment in the attack will not effect much if the men under them are, as always happens at the beginning of European and American campaigns, completely ignorant of the art.

When drawing a tactical lesson from a campaign of such old date, we must bear in mind the difference of the conditions from those of the present day. The greatly lesser range, accuracy and rate of fire of the weapons of that period permitted of entrenching being carried out much closer to the enemy than would be possible now, and this condition was intensified by the woody nature of the country which prevented vision. We shall not therefore see lines of entrenchment at the present day in such proximity as the map shows. They will begin at much greater ranges, though, as will be mentioned later, it may be possible by systematic slow advances, lasting perhaps several days, eventually to establish them in close proximity. The chief tactical lesson is to note the effect of Sherman's system of entrenching close in front of the enemy's line. The Northern lines of trenches held the defenders tight in their position. They did more than that however. The chief desideratum of a General is to force his enemy to conform to his movements, and not to be obliged to conform to those of the enemy. The extension of the Northern lines to the flanks forced the Southerners to conform for fear of being outflanked. This gave Sherman some latitude in selecting the direction of his flanking movements so as to secure that which gave the promise of the best strategic results. The strong line of the attackers' works absolutely denied to Johnston all knowledge of what was going on behind them, and prevented him from interfering with Sherman's preparations for the turning movement, either by a forward attack or by striking at the Northern communications.

Entrenchments so used in attack confer a considerable power. One of the effects of the powerful weapons of the present day is that flanking movements must take place at a greater distance and so require longer preparation and consume more time. The defender is thus given time to alter his dispositions to meet the movement or to interfere with it by offensive action. To obviate this disadvantage and to hold the defender to his place the throwing up of entrenchments by the attackers against the defenders' front is more than ever desirable. Reference will be made later to actions in which the necessity for holding the defenders to their positions while the flanking movement was being developed was not appreciated, with the result that the flank attacks failed.

The wars in Austria and France of 1866 and 1870 afford but little instruction in the subject under review. **Wars of 1866 and 1870.** Field fortification was certainly employed on many occasions to strengthen localities, generally villages or woods, occupied in the course of an offensive movement; but we do not

and any system of employment of the spade by the armies generally during attack in the manner indicated in the title of this essay or exemplified in the campaign just described and in those to be dealt with later. The lessons of the American War had at that time been in no way appreciated on the Continent of Europe where those operations were regarded as a mere conflict of armed mobs, not worth the study of soldiers. Moreover, as has already been mentioned, most armies enter on their campaigns with imperfect training in entrenching during the attack and little appreciation of its advantages. The wars of 1866 and 1870 were of short duration, and the victors, who in both cases were the ones to employ offensive tactics to the greater degree, did not suffer the preliminary defeats which usually lead to recourse being had to the spade as an auxiliary and partner of the rifle. The cause of their rapid successes may be traced, partly to the inferior organisation of their adversaries and the tactical and strategic errors committed by them, and partly to the superiority of the Prussian artillery and the good tactical combination of the three arms on their side.

It may be said and indeed is an article of belief in certain quarters that given good combination and proper tactical handling of the attacking forces, success in the attack of a defended position may be achieved at all times even in the present day, without recourse to entrenchment, which is said to have the defect of demoralising the troops and arresting the momentum of a well-ordered forward movement. This assertion however rests on the ideal and no proof of it can be found in the experiences of war in cases where both sides were equally matched in the above respects. The Japanese, whose organisation and combination in their recent war do not appear to have been inferior to those of the Germans, were far from finding that they could dispense with the assistance of the spade and had recourse to it more and more as the war went on. It is not wise moreover to assume that your opponent's forces will be worse organised or less well equipped than your own, and there can be no doubt that if the French and Austrians had been equal to the Prussians in these respects the results of some of the battles and the course of the campaigns would have been different. It is not unfair indeed to believe that under those circumstances some of the theories of war entertained in the Continent would have been different at the present day than at the time of the war.

In the Russo-Turkish War of 1877-78 considerable use was made of entrenchments, taken in the attack and made use of by both the combatants more particularly by the Turks. In fact the Russians took a lesson from the latter in this respect and only accomplished one of the special objects of the latter part of the war after the latter had been compelled to retreat on their enemies.

The Turkish success has a natural result in entrenchment and this success was very clearly an illustration of an organisation adopted with a view to the advantage to be taken of it. General Avramov

Russo-Turkish War
1877-78

Baker, who had a high command in the Ottoman army during this war, has described the Turkish system of employing entrenchments as follows:—

"The moment the Turkish soldier moved into a position near the enemy, even if it were possible that he might only remain in that position for one day, the pack-horses carrying the shovels and pick-axes were immediately brought to the front and there and then each battalion entrenched itself. The result was that if a Turkish army advanced, it left behind it a succession of entrenched positions on which to fall back in case of a reverse. The soldier, being constantly accustomed to the use of the pick-axe and the spade, took as much pride in the execution of this work as in the performance of his drill and manœuvre."*

During the earlier phases of the war the Russians neglected this useful auxiliary and suffered greatly in consequence, particularly in the attacks on Plevna. The Russian infantry battalions at that period were equipped with a certain proportion of entrenching tools, but the men had no training in their use, and, when difficult ground was encountered, or fatigue supervened, these articles were the first of which they rid themselves.

The attacks on Plevna were characterised by faulty formations and extraordinarily bad tactical organization, nor was any attempt made to seize and entrench points whence a good fire effect could be brought to bear, in order to cover the attacks or to hold the defenders fast in their positions and prevent them reinforcing the threatened points. The only portion of the Russian attacks in which any signs of decisive tactical handling were observed was in that entrusted to the division under Skobelev, on the extreme left in the third battle. Skobelev, by dint of good leading and combination of the units of his own force, succeeded in penetrating the Turkish line of works and in holding on to his position for 24 hours. As has already been mentioned his troops, for want of entrenching tools, endeavoured to obtain shelter by using their hands and bayonets and even the lids of their canteens. Not being supported by the other Corps leaders Skobelev was eventually compelled to retire.

The lesson however was learnt, and after Plevna the Russians attached almost greater importance to the use of entrenchments than the Turks. In the march to Constantinople Skobelev made every man in his division carry a full sized shovel slung on his back in addition to his arms and equipment, and so far from it being the first article discarded, everything else except the rifle and ammunition would go first.

The annals of our many wars and expeditions in Asia, and against savage tribes in Africa and elsewhere, afford no example that can be recalled of the use of entrenchments in the

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Asiatic and savage warfare.

* “The War in Bulgaria,” by Lieut.-General Valentine Baker, Pasha.

attack The reasons of this are not hard to find. One no doubt is that against undisciplined forces, armed with inferior or obsolete weapons, there is not nearly the same necessity for taking shelter against a fire which cannot compare in effect with that of weapons of precision in the hands of disciplined troops. But a stronger reason is that a great importance is attached to the moral effect on enemies of the former description of the steady, continuous, resistless advance of a disciplined force, and that to halt and take shelter will greatly encourage the enemy, and might evolve in him a spirit that would render truly formidable the great superiority of numbers which he usually possesses.

This state of things however belongs to the past, and it is extremely probable that it will by no means always be the same in the future. We have now to face the fact that many semi-civilised nations and tribes, especially some of those whom we may be called to encounter, have provided themselves with large numbers of modern weapons, and are far from inexpert in their use. The Afghan mountaineer, for instance, is as good a shot with the rifle as our own men, is adept at concealing himself, and, given a sufficient supply of ammunition, a defensive force of such men armed with magazine rifles, would be capable of inflicting at least as much loss as an equal number of regular soldiers. To meet these conditions the modes of attack adopted in Asiatic warfare in the past will need revision. It will be necessary to conform, at all events in some degree, to the tactics found necessary against civilised armies, and it is more than likely that the throwing up of cover during the attack will be found of signal advantage when the occasions arise which are alluded to above.

The principal reason why in the earlier battles of the South African War entrenchments were not used in the attack is probably to be found in the fact that the light entrenching implement carried by the infantry proved useless in the hard and at times stony soil of the theatre of war. The number of full sized picks and shovels carried with the transport of each battalion was too small to use on the scale required in attacking a position, and the nearest tool depôt was the Engineer Field Park with the Corps troops, which was too far off to be readily accessible. The question of the nature and distribution of entrenching tools will be discussed later, so the subject need not be pursued now. It cannot however be said that this was the only cause of the omission to use entrenchments in the attack at the beginning of the war. It can hardly be doubted that, had a definite desire existed on the part of the commanders that the troops should entrench, some arrangements could have been made for the issue of tools before an operation began to the units told off to the attack; also that on boulder-strewn hillsides where the spade is useless resort would have been had to rough stone sangars, which are often equally effective as trenches. The fact that at that period of the campaign nothing of this nature was attempted shows that

the commanders had not then appreciated the advantage conferred by the use of cover in the attack, and that this want of appreciation was shared by the authorities in England, who had omitted to have the regimental officers and men trained in this respect.

It is quite possible that the same reasoning which leads to the dispensation with the use of artificial cover in the attack in savage warfare was one of the underlying causes of its omission at the beginning of the war in South Africa. Owing to the circumstances which attended our last encounter with the Boers in 1881, the Generals in 1899 were naturally desirous of impressing on the latter the fact that the British soldier was fully capable of driving them by a sheer straightforward frontal assault from any position they might take up. Such a demonstration may no doubt have been desirable and politic, but to neglect a useful auxiliary on this account is only justified when success follows, which did not always happen in this case. To undervalue the power of an enemy is a dangerous practice, but the last war in South Africa is not the only time we have indulged in it, and history shows that it is not confined to the British army and nation.

The failures in some of the earlier battles of the war, and the indecisive results of some of the victories at a later date, may alike be traced, partly at all events, to the neglect of the use of entrenchments in the attack to hold the defender to his positions. When a frontal attack had proved impracticable, or was considered likely to be too costly, a wide turning movement on to the enemy's flank was generally inaugurated. This necessarily took time and was perhaps difficult to conceal. No attempt was made to hold the defenders fast in their positions while the movement was in progress by a frontal demonstration, though it is difficult to believe that with the aid of entrenchments such an operation would have been impracticable; the result was that the defenders had ample time to make fresh dispositions to meet the flank attacks, which thus became frontal ones on a new line, and were unsuccessful. Similarly, after Paardeburg, when victory had begun to settle upon the British standards, the facility with which the Boers could be dislodged from strong positions by wide enveloping movements of mounted troops proved a strong temptation for our leaders to avoid heavy losses, and thus caused them to miss the decisive and crushing victory which would in all probability have resulted if the enveloping movements had been accompanied by a strong demonstration by infantry with rifle and spade against the defenders' front.

The tactics employed by Lee at Chancellorsville, by the leaders of both sides in the sanguinary battles of the Wilderness in 1864, by Sherman in the Atlanta campaign, by Grant before Richmond, prove that those commanders,—who were probably the ablest and most experienced tacticians of any who have commanded armies in the field since the Napoleonic wars,—attached the highest value to the

use of entrenchments for the above purpose, and never neglected to avail themselves of them. Although it must be admitted that the increased power of the weapons of the present day has rendered operations of this sort more difficult than before, it by no means followed that they had become impracticable, and the actions of the Japanese in Manchuria have since proved that this is not the case. The disengagement of troops from action, even when on the defensive has for a long time been recognised as a very difficult operation. Every increase in the range, accuracy and rate of fire of guns and rifles makes it more so. To hold an enemy to his position, to command by fire the ground over which he must retreat, can be accomplished at longer range than formerly, and are in that way perhaps even easier of accomplishment. The seizure and entrenchment of positions whence this may be effected may therefore give rise to more valuable results than ever.

The investment and capture of Cronje's force at Paardeburg was the first occasion in this war of the systematic and deliberate use of entrenchments in the attack. After the unsuccessful attacks, attended by considerable loss of life, which took place on the 18th February 1900, under the direction of Lord Kitchener, and are known as the battle of Paardeburg, it was decided by Lord Roberts not to attempt any further direct assault on the Boer position, but to surround and hem in Cronje's force, bombarding and pressing it till it should be forced to surrender. During the next few days the British slowly and cautiously gained ground towards the enemy's laager, entrenching themselves as they went. On the west of the laager the 19th Brigade, which formed part of the 9th Division under Lieutenant-General Colville, established themselves on the right or north bank of the Modder River within 550 yards of the enemy's trenches, and extended their entrenchment for some distance across the veldt to the north-east, in a direction oblique to that of the Boers. On the west the 7th Division under Lieutenant-General Tucker established themselves in a similar manner, and, being favoured by the presence of lateral ravines which gave cover, had by the 26th February pushed forward their trenches to within 250 yards of the nearest Boer works and some 600 yards from the main laager.

On the night of the 26th-27th February an advance on the Boer position was made by a portion of the 9th Division. Six companies of the Royal Canadian Regiment were formed up in double line, the front rank with fixed bayonets, the rear rank carrying picks and shovels. It was intended that they should endeavour to rush the position in the darkness, but if discovered they were to halt and entrench themselves on the ground gained. Thirty sappers of the Royal Engineers accompanied the advance to assist in the entrenching. Other battalions of the 19th Brigade were placed as support on the left rear and in the main trench vacated by the Canadians.

At 2-15 A.M. the advance began. The following is how the operation is described in the *Times History of the War*:—"For nearly 500 yards the line advanced undetected. Suddenly at 60 yards' range a tremendous fire was opened on them from the Boer trench. The Canadians threw themselves down and replied vigorously, and the rear rank and Engineers at once began digging for dear life. On the left, indeed, the line failed to hold its own, and, after a few minutes, gave way. But G and H companies on the right did not recede more than 20 yards at the most, and for nearly two hours kept firing away, while the trench was being completed. Daylight found the two companies admirably entrenched within 90 yards of the enemy, and in a position enfilading the whole of the enemy's trenches parallel to the river."* About an hour later the white flag was displayed and Cronje surrendered with the whole of his force.

The employment of entrenchment in the operation above described was not for the purpose of holding the enemy to his place while another body of the attackers worked round to his flanks or other weak points, as has been the case in some of the operations previously dealt with in this essay. At Paardeburg the troops who made the entrenchments were at that time the only ones actually engaged in a definite attack, and the object of the entrenchments was to gain as much ground as possible, and also, if practicable, to secure a position dominating in some way that of the defenders. The employment of entrenchment in this manner, especially when combined with an advance by night, is distinctly a characteristic of modern warfare, and will doubtless be met with still more frequently in the future. It often offers the best chance of success in the attack of a strong defensive position and occasionally perhaps the only practicable one. When successful it may lead to most valuable results, but success in such operations is by no means easily achieved and it is probable that chance enters more into them than into any other form of military action.

In the case of Paardeburg it may be admitted, without detracting in any way from the skill and courage with which the enterprise was carried out, that good fortune was largely instrumental in securing the decisive result. It was certainly a fortunate chance that the situation of the entrenchment—taken up at haphazard at the spot where the troops happened to be when fire was opened against them—was such that it rendered the Boer trenches untenable. In some other cases of night advances, followed by entrenchment of the position gained, the result was very different. For instance at the attempt to occupy Spion Kop the attacking force, misled by the darkness and the early morning mist on the mountain top, executed a trench which not only proved when daylight supervened to have a totally inadequate field of fire, but also to be enfiladed at short range from a knoll which the enemy immediately occupied. The ultimate result of this mischance was that the attackers suffered great loss and were unable to hold the hill.

* The *Times*' History of the War in South Africa, Vol. III.

During the remainder of the war cases often occurred of positions being seized and immediately entrenched in the course of a generally offensive movement, and in the latter stages every little column that took the field had a supply of tools with it for this purpose ; but no other case, quite similar to that of Paardeburg, can be found of a force engaged in a deliberate frontal attack on a position entrenching themselves as they gained ground. The reason for this probably was that after Paardeburg the Boers never again made a really obstinate resistance. The British Generals, as already mentioned, had discovered that it was easier to manœuvre the enemy out of his positions by enveloping his flanks than to drive him out by frontal attacks. The Boers too had learnt to respect their adversaries' power of manœuvring and never held to their positions once their flanks were threatened. The result was that an imperative need for a deliberate advance with entrenchment did not again arise.

The published records of the war between Russia and Japan are not as yet in sufficient detail to enable us to give concrete instances of the use of entrenchments in the attack. There is however ample evidence to show that the Japanese in the later phases of the war habitually employed the spade on such occasions. Like the Americans in 1864 and the Turks in 1878, as soon as the firing line halted, the men would begin to dig. The following is a description by a Japanese officer of their method. "In our methods of attack we believe we have perhaps gone one better than our European models by making use of fortification. Entrenchments are not meant for defence, but to afford resting places in the advances. In the firing line the alternate men dig while the others shoot. But we dig differently to European troops. Our active little men dig lying down. They offer no target to the foe, and the front line sinks unnoticed into the ground; the next finds a bed already made. As we entrench at every stage of the attack, we can dispense with strong reserves. We advance as strong as possible with a large reserve echeloned behind the flanks only."*

It was not however till they had been fighting for some time and had gained their experience in the same way as other armies do that these articles were adopted. At the beginning of the war the Japanese were imbued with the ideas of their continental models, and believed that with troops animated with the spirit of their own a sustained assault in the regulation continental formation would be successful against a well entrenched position. The advantages conferred by wider formations and by the systematic use of cover, natural and artificial in the attack were not appreciated till battle experience had imperiously demonstrated them. Thus on the 27th May 1904 the Russian lines at Nanshan were assaulted by the Japanese in a

* Lieutenant-Colonel Masahika Kawamura, quoted in the *Military Wochenblatt*, p. 1035 of 1903, and in a note communicated to the Journal of the R. U. S. Institution by the Director of Military Operations, War Office.

formation similar to those of the Germans, with the result that notwithstanding the heroism of their infantry the frontal attacks failed after suffering extremely heavy losses. That the Russian position was eventually captured was probably largely due to the fact that the defenders' dispositions were even more unsuited to the conditions of the present day than those of the attackers, and also to their commander failing either to make use of counter-attack upon the shattered Japanese columns or to employ his reserves with determination. The Japanese gunboats in Kinchao Bay were able to bring an enfilading and even reverse fire upon the works on the left of the Russian line, and under cover of this the Japanese 4th Division was able, by wading through the shallow waters of the bay, to turn that flank of the defences and carry the heights at that end of the line. Thereupon the 1st and 3rd Divisions, who had been repulsed in the frontal assaults, charged once more and drove the Russians out of the trenches in front of them. Thus the flank and frontal attacks in combination succeeded in forcing the position. It is extremely doubtful, however, whether any European commander whose troops had suffered such a severe handling as the Japanese 1st and 3rd Divisions in this combat would have ventured to call on them for a further effort.

Again, at the battle of Telissu on the 15th June 1904, the Japanese infantry advanced to the attack in four lines, the first two extended at short intervals, the third in close order, and the fourth in company columns, and put in force the decisive attack as practised on the manœuvre grounds of Continental Europe. After suffering very heavy losses the remnants lay down under what cover they could find close up to the enemy's works and remained there till nightfall, when the Russians retreated.

After this battle these costly tactics were abandoned for ever. The troops rapidly adapted themselves to the conditions of the times, and wider extensions and a skilful use of the ground were the characteristics of the Japanese attack at Liaoyang and Mukden.

As a general rule in the later stages of the war advances over the open were made and entrenchments executed under cover of the night, the ground having been reconnoitred by scouts by day. Where, however, daylight entrenchment under fire was necessary the following seems to have been the method employed. If practicable the companies would halt under cover in rear of the position which it was desired to entrench and extended to the intervals obtained by the men clasping each other's hands with arms outstretched. The group leaders, or as we should say, squad leaders, went forward and when they topped the rise and came under fire, threw themselves down and crawled forward to a position whence a good field of fire could be obtained. The rank and file followed, threw themselves down in turn, and crawled on to a position alongside their group leaders, filling up the gaps between them, each man adjusting his own position slightly forward or backward so as to obtain the best field of fire. They then began to dig lying down, in pairs, one

man digging and the other firing, alternately. The pits thus formed would, when an opportunity occurred, be connected to form a trench.

In the cases over the open the procedure would be similar except that the start could not be made from under cover and the extensions would be wider. The group leaders would go in advance, select the position for the next halt and lie down, the remainder of the group following, would align themselves roughly on them, lie down and begin to dig, always in pairs, one shooting and one digging. When this line advances its half formed pits would be occupied by the second line, who would improve them and so leave better cover for the third line, and so on.

On some occasions steel shields were provided to cover the men told of to cut wire entanglements under fire, and at Mukden, when the ground was frozen so hard that digging was impossible, the men carried sandbags behind which they sheltered when they lay down to fire.

The operations of the Russians afford no lessons in the use of entrenchments in the attack, for, although they made use of field fortification largely, it was invariably on the defensive, and their tactics generally were almost entirely of the latter description.

Before we leave the subject of the Russo-Japanese War, it is worth while to notice a somewhat remarkable example of the use of field fortification by troops engaged on an offensive operation, which, though different from those which have been considered hitherto, must be held as coming within the scope of the subject under review, and as entirely worthy of imitation under similar circumstances in the future.

When the Japanese in April 1904, were about to attack the Russian position on the Yalu River they decided on massing their field guns and howitzers on a large island in the bed of the river whence they could bombard the Russian trenches and cover the attack about to be made by their own infantry. It was considered, however, desirable to conceal their position from the enemy, both so that the latter should not suspect from what direction the blow was to fall, and also that they should be unable effectively to reply. The soil was light and sandy and well adapted for entrenchment. The guns were moved over and the work carried out by night. The following description by Sir Ian Hamilton, who was an eyewitness, testifies to the remarkable nature of the operation:—

“Every advantage was taken of the natural lie of the ground and much artifice was employed to conceal the position from the Russian gunners on the north bank of the river. Trees were transplanted a short distance in front of the batteries to hide the tell-tale flash of discharge, and were carefully chosen from amongst those which were growing either directly in front or directly behind the entrenchments to be concealed. The next morning the landscape appeared unchanged from the Russian side of the river, as the fact that a tree of a particular shape had advanced or retired two or three

hundred yards during the night was naturally imperceptible. Poles were stuck in the sand and connected by a string on which branches were suspended. The earth dug out of the deep gunpits was most carefully and with great labour scattered broadcast so as not to disclose any irregularity of terrain. The howitzer pits and epaulments were connected by trenches, and numbers of covered ways leading down to the river bank showed the trouble that had been taken to ensure a plentiful supply of water for laying the dust which is otherwise so apt to rise with the shock of discharge and give away the position.

When all had been done that could be done to ensure concealment, then all was done that could be done in the time to ensure safety if concealment should chance to fail. Bombproof shelters were made for the men and were dug so deep and were so strongly roofed over with heavy baulks of timber that they would have resisted heavy siege artillery, let alone the field guns which were all they had to fear. Telephone stations, depots for reserve ammunition, etc., were all strongly fortified with earthworks and heavy timber baulks, so arranged to be invisible from the other side of the river, whence we, when we rode over after inspecting them, were unable to locate them, although of course we knew their approximate position.

All this was accomplished in one night, and although the soil was light and easy to dig, yet, when I saw those deep trenches, the platforms and the enormous baulks of timber, and recognized that the very trees had been shifted about as unconcernedly as a gardener transplants a rose bush I confess I was fairly surprised.*

The result of these elaborate preparations was that the next day the Russians were completely ignorant of the existence of this mass of artillery (72 field guns and 20 howitzers: concealed immediately in their front, until the moment when the latter opened fire about the middle of the day, and then they were unable to make any effective reply. A Japanese artillery brigade commander is reported as having stated that his command, though in action throughout, suffered no casualties whatever, and that not one of the Russian shots came anywhere near it. The enemy seemed entirely unable to locate it. The Russian guns were silenced after a short and one-sided combat.

This incident, occurring in a purely offensive operation, shows that the throwing up of shelter for infantry is not the only way in which field fortification can be usefully employed in the attack. The great advantage that may arise in some cases from being able to oppose to your enemy on the morn of a decisive attack a strong line of guns completely sheltered from fire and view is one that can hardly be over-estimated, and may be worth expending great labour to obtain. It also illustrates the extraordinary pains the Japanese always took in making the most complete preparations to ensure success in their operations, even in a case like this one, where they possessed a large superiority in strength, both of infantry

* A Staff Officer's Scrapbook, by Lieutenant-General Sir Ian Hamilton.

and guns, over their opponents. Unlike the British Generals in South Africa, the Japanese commanders in this their first encounter on land with the Russians, resolved to take no chances at all but to neglect no auxiliary, no labour, that might assist in making victory certain.

Employment of entrenchment in the attack under the conditions of the present day.

Having now examined at some length the methods and purposes of the employment of field fortification in the attack in various recent wars, we may turn to the consideration of its application to the conditions of the present day. It will be advisable to investigate theoretically the probable tactical conditions under which the next great war is likely to be carried on, and to enquire to what extent they will affect the application of this auxiliary of the attack. The advantages that may be expected from it and the manner of its employment will here be discussed. If we arrive at the conclusion that its adoption will be at least as advantageous in the future as it has been in the past, we must pass to a consideration of the most suitable organization to permit of its practice by the British and Indian armies. Under this head will come the question of the training of the troops in the use and construction of entrenchments in the attack and also that of the nature, distribution and carriage of the necessary tools.

Tactical methods ought to be changed every few years with successive improvements in weapons. Owing however to the difficulty of judging of the effect of the latter until they are tried in war, changes in tactical methods usually lag considerably behind the changed conditions which have called them forth. Differences in the conditions of the theatre of war and in the description of enemy encountered also demand changes in methods, which are often not realized until demonstrated by actual experience of battle. This is particularly the case with the British army who may be called upon to fight in all quarters of the globe and against all types of enemy. It is therefore especially important that we should not base our theories of the best organization and methods for our next war exclusively upon the experience of one or two recent ones. The methods that answered in Manchuria or in South Africa may prove quite unsuitable in campaigns fought against a different class of enemy in Europe or Central Asia.

It is always a mistake to generalize from one or two particular cases. What is required is that, while bearing in mind the broad principles which the history of many previous wars shows us as governing the art of giving battle, we should try to realize in our minds the effect that modern conditions have brought about; we should endeavour to project ourselves into the future and forecast the probable changes that may be in store, and we must, above all,

take into account the varying natures of possible theatres of war and the characteristics, organizations and weapons of our possible foes.

In the following words a distinguished French soldier has summed up the methods of the attack in the present day: "To march and attack by night, to burrow in the ground by day, such are the essential characteristics of the tactics rendered necessary by the power of the weapons of to-day. In the offensive the tool of the Pioneer has become indispensable to each infantryman. He must be trained to dig while lying down, and to bury himself thus little by little until he is quite sheltered. The trenches excavated by the advanced lines are successively occupied by the reserves."*

The general aspects of a modern battle, in which one side is attacking another in position, appear to be somewhat as follows. The position of the defenders is only known approximately and the latter are probably entirely invisible. The only evidence of their presence is the sound of their firing, the whistle of their bullets and the bursting of their shrapnel. Even their guns are unseen, though here and there by aid of glasses it may be possible to locate a battery by the dust thrown up by the discharge. The attacking infantry advance in widely extended order from the moment they come within effective range, though under certain conditions of terrain and atmosphere extension may be found necessary at very long ranges. As the musketry fire becomes more intense and accurate, the orderly lines of skirmishers break up into groups utilizing every hollow or fold of the ground for their halts between forward rushes, and even following the course of ravines, banks, hedgerows or any feature which will allow them to advance under cover. In such cases the advance of a section will often be in single file, stealing along in stooping position, until the next piece of open is reached, when the extended line formation is resumed and the men lie down and fire. The positions selected for the temporary halts are such as offer facilities for the development of rifle fire against the enemy's position.

In a well ordered attack the forward advance of a unit is covered by the sustained fire of the neighbouring ones, with a view to disturbing the aim of the defenders and keeping them below their cover. For a similar reason the infantry advances are accompanied by bursts of rapid artillery fire from the attackers guns, firing perhaps over their heads from the rear, or from a flank.

If the terrain is open there comes sooner or later a point beyond which the infantry advance cannot be sustained under the aimed fire of the defenders. Heavy losses have probably supervened and the attempt to make them good by reinforcement across open ground only leads to further loss and to further demoralization. The slightest movement, even of individuals, in the attacking line calls forth

* General De Negrier. "Some Lessons of the Russo-Japanese War," translated in the Journal of the R.U.S.I. from the *Revue des Deux Mondes*.

an outburst of rifle fire, and those who are lying prone in the open without cover find themselves unable to move either forward or backward. Under these circumstances the advance comes to a stand still ; the men remain prostrate till nightfall brings the opportunity for retirement.

It is evident that if the attacking troops have been trained and equipped in such a manner that the men are able to throw up cover for themselves while lying down, they possess a great advantage. If further, instead of retiring

**Advantage conferred
by entrenchment under
these conditions.**

at nightfall, their organization and tactical training are such that reinforcements are pushed forward as soon as darkness allows of it to secure the ground gained, to connect the isolated pits into a continuous trench and to excavate trenches of communication from the rear, a distinct advance will have been achieved, and a base gained for the resumption of the attack the next day.

Even if the volume of the defenders' fire and the want of cover between the trench thus made and the enemy's position make an advance from the trench impossible, yet the establishment of a strong firing line under cover in this position will consist considerably in establishing that fire superiority by which alone the conflict will be decided.

In such a case the pressure brought above by the establishment of this strong firing line will in all probability facilitate an advance by some neighbouring body of troops, who in their turn may be able to seize and similarly entrench a position whence a powerful fire may be directed on to the enemy's works. If communicating trenches from the rear are constructed at night fresh rifles can be brought up into the firing line, losses made good, water, food and ammunition supplied, even in daylight during the progress of the fight. If the lines of firing trench established by the attackers are situated so as to envelope, even if only slightly, those of the defenders, the development of superior fire effect will be greatly facilitated. With the aid of accurate rapid fire from the Q. F. batteries, firing perhaps over the heads of the attacking infantry, it will probably be possible to break down the defenders' resistance and confine them below their parapets, and thus permit of further advances by short rushes from some parts of the attacking line. In this manner positions still further in advance can be reached and entrenched, and gradually a line established in such proximity to the hostile works, and the defenders so demoralized, that a bayonet assault is practicable.

The more we consider the principles under which the attack must be conducted in modern times, the more we recognize the possibilities that are open to troops who are suitably equipped and thoroughly trained for the employment of entrenchment in that operation. Our Manual of Combined Training (probably the best of its kind in any language) tells us that "the best type of an offensive battle is a methodical progression from point to point; each successive

capture weakening the enemy's hold on his main position, and paving the way for a final decisive advance; each successive advance being deliberately prepared and systematically carried out." Again we are told that "it will, as a rule, be necessary for the troops to secure one point of vantage before they attack the next," and the tactical plan recommended as the most suitable for the attack of the enemy in position is as follows: "To outflank at least one of the enemy's wings; to seize localities from which a searching and sustained fire may be developed against a weak point of the position; to strike at that point heavily, unexpectedly, and in the greatest strength possible; and elsewhere to establish bodies of infantry so close to the enemy's line as to hold him to his ground and to prevent him from either changing front, or from reinforcing the troops defending the line of attack." *

The great assistance that entrenchments will afford in the above described methods of attack hardly requires demonstration. Examples have been given in the foregoing pages of their employment to establish bodies of infantry close to the enemy's line in order to hold him to his ground and prevent him altering his dispositions to meet the main attack. For securing each point of vantage acquired in the course of the battle and in the deliberate preparation for the next advance they are equally valuable.

Since the wars which have been dealt with in the previous portion of this essay, the infantry weapon has remained practically unaltered, but that of the artillery has undergone a change which has greatly modified the tactics of that arm, and may conceivably influence those of the others. The change referred to is the introduction in the principal European armies, including our own, of the quick-firing, barrel-recoiling, shield-protected field gun.

One of the probable effects of this weapon will be to make battles even slower and longer than the recent wars proved them to be. The power possessed by the new artillery of suddenly concentrating an extremely rapid fire of shrapnel upon any body of troops who may expose themselves, even for a short time, will force the attacking infantry to display particular care not to afford a target; it will lead to an even more careful use of cover than before and will make a reliance on entrenchment even more necessary. The tendency for advances to be made by night in order without loss to approach the objective will probably increase. On the other hand, it should be remembered that the advantages conferred by these new weapons will not be all on the side of the defence. If ever they are able correctly to locate a portion of the defender's position, the attackers' guns will be able to pour on it for a short time such a hail of projectiles that the occupants of the trenches, unless protected by overhead cover, will certainly be unable to use their rifles against the advancing infantry. The possibility of

* Combined Training, s. 110.

concealing defensive works depends on the nature of the terrain and the atmospheric conditions. These will not be as favourable for this purpose as they were in South Africa. In such cases the attacking guns will be able to exercise a very powerful effect.

The nature of the ground and the configuration of the battle-field will naturally have an influence on the tactics of the attack and the possibility of employing entrenchment therein. In Manchuria the methods adopted in the flat highly cultivated plains on the west of the Japanese direction of advance must have differed from those in the stony mountains on the east: the soft undulating soil and moist atmosphere of England, and the wide cultivated plains of parts of Continental Europe, would offer different problems from those which presented themselves to soldiers warring on the hard veldt, abrupt kopjes and in the dry clear air of South Africa. The passes of the Hindu Kush and the stony valleys of the Helmund, if ever we are called to fight for them, will present yet different conditions.

Very enclosed or woody countries require different methods of fortification from the ordinary, and necessitate different tools. Hedgerows are very easy to make defensible and often give ample cover and concealment as they stand, all that is required being to make openings through which the rifle can be used. The cutting down of the hedge, or any action that will advertise the fact that it is occupied, is of course above all things to be avoided. Fighting in enclosed country in many ways presents features entirely different from those of operations in open country, and it is a wise decision that has brought about manoeuvres for the army in England in such country in recent years. Although facilities for unobserved advances and for the use of cover are afforded by the hedgerows and the undulations of the ground, yet these very features allow of unpleasant surprises and local counter-attacks being delivered by the defenders. Moreover the difficulty of ascertaining the defenders' position and of knowing what your own side are doing has a very disconcerting effect.

In mountain warfare the nature of the soil will often preclude altogether the construction of entrenchments to aid the attack, and the burden of a heavy entrenching tool, in addition to the rifle and equipment, may prove a great encumbrance in stiff hill climbing work. In such cases, however, the hills are generally covered with small rocks and boulders, which, if not large enough to give cover individually, can easily be built up into low walls or sangars. Such shelters, if properly constructed, give just as much cover against rifle and shrapnel bullets as a trench or pit.

There is every reason to believe that if the soldier of the present day be systematically and intelligently trained in the habit of utilising all existing cover when advancing to the attack, and when none exists, of making it for himself by whatever means are available, he will, if equipped with suitable tools, be capable

of adapting his methods to the conditions of whatever country he may be called upon to operate in. The proper training is an even more important matter than the nature of the tools, but before proceeding to it, it is necessary to enter in some further detail into the question of the actual manner of performing the entrenching work, and as this is inseparably bound up with the question of the nature and mode of carriage of the necessary tools, the latter question must be considered first.

Nature and mode of carriage of entrenching tools.

It is quite evident that if the only tools with which an army is provided are situated on the Corps or Divisional dépôt, it will hardly be practicable to employ entrenchment in the attack at all. The desirability of providing an entrenching tool as part of the personal equipment of the infantry soldier began to be recognized soon after the Russo-Turkish War of 1877-78. We have already seen how Skobelev made every man of his division during the march to Constantinople carry slung on his back a full sized shovel, the weight of which was over 7 lbs. The burden and encumbrance of such a tool must, however, have considerably reduced the marching power of the men. Modern war makes greater demands upon the endurance of the soldier than used to be the case; the tendency of the present day is to reduce as far as possible the load carried by the men, and in our army we have gone further in this direction than any of the continental nations. To burden and encumber the soldier with a heavy tool, and so increase the already difficult task of bringing him fit and fresh to the point of contact, would probably be a greater disadvantage than to have him without an entrenching tool when advancing to the attack.

The Turkish system, as already described, consisted in carrying the tools on regimental pack horses. This system is in many respects a good one, but, though it may have answered well in 1877, it is doubtful whether it completely fulfils the requirements of the present day. Widely extended battle formations have now to be taken up at a much greater distance from the enemy than formerly. Pack horses could not accompany the troops into effective musketry range, where the tools would be wanted, and tools cannot be issued to men once they have taken up extended order. If it were intended to entrench in the attack, the issue of the tools would have to take place at a very early stage in the operations. Again, advanced guards and flank guards move now-a-days at a much greater distance from the force they cover; the flanking parties may be scrambling along hill tops far away from the road on which the main body is moving. If there were any chance of their wanting tools they would have to carry them from the start. Lastly, it is often impossible to foresee when any body of troops, particularly a small one, might not be thrown on the defensive, and would require tools to throw up defensive cover. Everything therefore shows that the necessity is

even greater than formerly for every infantry soldier to carry an entrenching tool on his person at all times.

It is essential that if a tool is to be carried on the person of the soldier it must be as light as possible in weight so as to add as little as possible to his burden; and it must be of such a length and shape, and attached in such a manner to his equipment, that it will not interfere with his movements in marching, and will not impede him in the use of his rifle in all positions including when lying down. It is evident that ordinary full-sized picks and shovels would not fulfil these conditions. For many years past efforts have been made in the British and some Continental armies to devise tools that would be sufficiently light and portable for the purpose. Another drawback to the ordinary tools is that to dig in normal soils requires the use of both pick and shovel. A soldier, however, cannot carry two tools and also use his rifle, so two men are required to dig. With the wide extensions of the present day this may often give rise to great difficulties owing to the separation of the man carrying the pick from the one with the shovel. Efforts have therefore also been made to design an instrument which would combine in itself the functions both of pick and shovel.

Essential requirements for portable tools.

After several trials a tool called the Wallace entrenching implement was introduced in the British service (Home army), and issued to the infantry as a part of the soldier's personal equipment. This instrument, the construction of which showed much ingenuity, was a combination of shovel, pick and grubber; it weighed 2lbs. 3oz. and was attached to the soldier's accoutrement by a leather loop. Practical experience however after a short time showed that it was impossible to carry the Wallace entrenching implement without interference with the soldier's movements when marching or with the use of his rifle when firing. All efforts to remedy this defect having failed, this implement was withdrawn.

Portable implements tried in the British Service.

After a while another form of portable entrenching tool was introduced. This consisted of a light pick and a light shovel which were issued in the proportion of 32 shovels and 16 picks per infantry company. These tools were carried in a leather frog slung on the waist belt. The shovel weighed 2lbs 2oz. and was 2 feet $1\frac{1}{2}$ inches long over all, and the pick, the head of which was pointed at one end and of an axe shape at the other, was 2lbs. 9oz. in total weight and 1 foot $10\frac{1}{2}$ inches in length. These were the tools taken by the troops to South Africa, which, as already narrated, were speedily found to be too light and weak for use in the hard and stony soil of that country, and were therefore discarded.

In addition to the portable tools described above, each infantry battalion in the war in South Africa was equipped with 20 heavy picks and 20 heavy shovels, which were carried in the regimental transport. The picks had a 6 $\frac{1}{2}$ lb. head and weighed with

Heavy tools in the British service.

helve nearly 8lbs., and the shovel weighed 5lbs. 4oz. This number was so small that these tools were only useful for camp work, and when entrenching had to be done, tools had to be obtained on indent from the R. E. Field Park which formed part of the Corps Troops.

After the abolition of the portable entrenching tools a General Service shovel weighing $3\frac{1}{2}$ lbs. was introduced into the Home service, and also a pick with $4\frac{1}{2}$ lbs head, but with a heavy helve bringing its total weight still up to 8lbs. Each battalion now carries in its transport 222 of these shovels and 148 of the picks, and is therefore equipped to carry on entrenching work of some magnitude without having to draw on the R. E. Field Park. In addition to the battalion tools each infantry brigade carries a reserve of 80 picks and 120 shovels. The battalion tools are carried on two tool carts and eight pack animals, (*i.e.*, one per company), and the brigade reserve in one G. S. wagon. The Company pack animals will march immediately in rear of each Company, and in action will follow their companies as closely as the enemy's fire will admit. From this distribution it may be inferred that the principle of having portable tools as part of the soldier's personal equipment has in the Home service, for the present at all events, been abandoned, and that it is intended that the present pattern of pick and G. S. shovel shall be used in the attack.

All who have had much experience in the supervision of excavation work know that it can be done better, quicker, and with less fatigue to the excavator with a tool of full size and weight than with a short or light one. A navy or experienced digger will always choose to work with full-sized tools in any soil. A short tool entails more stooping to the work and so induces more fatigue, and a light tool requires a greater effort to make it penetrate the ground and is liable to bend or break. In the British service there is a shovel weighing 5lbs., having a handle 2 feet 4 inches long, and a heart-shaped blade 12 inches long and $10\frac{1}{2}$ inches wide. This tool is strong enough for use in very stiff soils and is capable of doing any excavation work that a soldier is likely to be called on to perform. It is carried by the Royal Engineers only.

The $3\frac{1}{2}$ lb. G. S. shovel with which the infantry are equipped has a handle of the same length as the R. E. shovel, and is therefore a convenient tool to use. Its head however is only 9 inches long and 8 inches wide and is distinctly weaker, so it would not stand such heavy work. Still, on the whole, it is a good tool and equal to most ordinary work. The disadvantages for digging purposes of its lesser weight and strength are probably counterbalanced by the reduction in the load borne by the soldier, who, having no portable tool, as already pointed out, often has to carry this shovel for a considerable distance from the point where the tools are issued from the transport animals. It also requires less transport than the heavy shovel.

hundred yards during the night was naturally imperceptible. Poles were stuck in the sand and connected by a string on which branches were suspended. The earth dug out of the deep gunpits was most carefully and with great labour scattered broadcast so as not to disclose any irregularity of terrain. The howitzer pits and epaulments were connected by trenches, and numbers of covered ways leading down to the river bank showed the trouble that had been taken to ensure a plentiful supply of water for laying the dust which is otherwise so apt to rise with the shock of discharge and give away the position.

When all had been done that could be done to ensure concealment, then all was done that could be done in the time to ensure safety if concealment should chance to fail. Bombproof shelters were made for the men and were dug so deep and were so strongly roofed over with heavy baulks of timber that they would have resisted heavy siege artillery, let alone the field guns which were all they had to fear. Telephone stations, depots for reserve ammunition, etc., were all strongly fortified with earthworks and heavy timber baulks, so arranged to be invisible from the other side of the river, whence we, when we rode over after inspecting them, were unable to locate them, although of course we knew their approximate position.

All this was accomplished in one night, and although the soil was light and easy to dig, yet, when I saw those deep trenches, the platforms and the enormous baulks of timber, and recognized that the very trees had been shifted about as unconcernedly as a gardener transplants a rose bush I confess I was fairly surprised."*

The result of these elaborate preparations was that the next day the Russians were completely ignorant of the existence of this mass of artillery (72 field guns and 20 howitzers) concealed immediately in their front, until the moment when the latter opened fire about the middle of the day, and then they were unable to make any effective reply. A Japanese artillery brigade commander is reported as having stated that his command, though in action throughout, suffered no casualties whatever, and that not one of the Russian shots came anywhere near it. The enemy seemed entirely unable to locate it. The Russian guns were silenced after a short and one-sided combat.

This incident, occurring in a purely offensive operation, shows that the throwing up of shelter for infantry is not the only way in which field fortification can be usefully employed in the attack. The great advantage that may arise in some cases from being able to oppose to your enemy on the morn of a decisive attack a strong line of guns completely sheltered from fire and view is one that can hardly be over-estimated, and may be worth expending great labour to obtain. It also illustrates the extraordinary pains the Japanese always took in making the most complete preparations to ensure success in their operations, even in a case like this one, where they possessed a large superiority in strength, both of infantry

* A Staff Officer's Scrapbook, by Lieutenant-General Sir Ian Hamilton.

and guns over their opponents. Unlike the British Generals in South Africa the Japanese commanders in this their first encounter on land with the Russians, resolved to take no chances at all but to neglect no auxiliary, no labour, that might assist in making victory certain.

Employment of entrenchment in the attack under the conditions of the present day.

Having now examined at some length the methods and purposes of the employment of field fortification in the attack in various recent wars, we may turn to the consideration of its application to the conditions of the present day. It will be advisable to investigate theoretically the probable tactical conditions under which the next great war is likely to be carried on, and to enquire to what extent they will affect the application of this auxiliary of the attack. The advantages that may be expected from it and the manner of its employment will here be discussed. If we arrive at the conclusion that its adoption will be at least as advantageous in the future as it has been in the past, we must pass to a consideration of the most suitable organization to permit of its practice by the British and Indian armies. Under this head will come the question of the training of the troops in the use and construction of entrenchments in the attack and also that of the nature, distribution and carriage of the necessary tools.

Tactical methods ought to be changed every few years with successive improvements in weapons. Owing however to the difficulty of judging of the effect of the latter until they are tried in war changes in tactical methods usually lag considerably behind the changed conditions which have called them forth. Differences in the conditions of the theatre of war and in the disposition of enemy encountered also demand changes in methods which are often not reached until demonstrated by actual experience of battle. This is partly the case with the British army who may be said upon to fight in all quarters of the globe and against all types of enemy. It is therefore especially important that we should not base our theories of the best organization and methods for our first war exclusively upon the experience of one of its recent outbreaks. The methods that prevailed in Mundaikapur in South Africa may prove quite unsuitable in a campaign in the future in a very different theatre of war in Europe or Central Asia.

It is always a mistake to generalize from one or two particular cases. What is true of one war is not necessarily true of all. It is a principle of the history of war that the conditions of a campaign govern the tactical organization of the army. The tactical organization must adapt itself to the conditions of the campaign, and not the other way round. The probable tactical conditions of the next great war are not

take into account the varying natures of possible theatres of war and the characteristics, organizations and weapons of our possible foes.

In the following words a distinguished French soldier has summed up the methods of the attack in the present day: "To march and attack by night, to burrow in the ground by day, such are the essential characteristics of the tactics rendered necessary by the power of the weapons of to-day. In the offensive the tool of the Pioneer has become indispensable to each infantryman. He must be trained to dig while lying down, and to bury himself thus little by little until he is quite sheltered. The trenches excavated by the advanced lines are successively occupied by the reserves." *

The general aspects of a modern battle, in which one side is attacking another in position, appear to be somewhat as follows. The position of the defenders is only known approximately and the latter are probably entirely invisible. The only evidence of their presence is the sound of their firing, the whistle of their bullets and the bursting of their shrapnel. Even their guns are unseen, though here and there by aid of glasses it may be possible to locate a battery by the dust thrown up by the discharge. The attacking infantry advance in widely extended order from the moment they come within effective range, though under certain conditions of terrain and atmosphere extension may be found necessary at very long ranges. As the musketry fire becomes more intense and accurate, the orderly lines of skirmishers break up into groups utilizing every hollow or fold of the ground for their halts between forward rushes, and even following the course of ravines, banks, hedgerows or any feature which will allow them to advance under cover. In such cases the advance of a section will often be in single file, stealing along in stooping position, until the next piece of open is reached, when the extended line formation is resumed and the men lie down and fire. The positions selected for the temporary halts are such as offer facilities for the development of rifle fire against the enemy's position.

In a well ordered attack the forward advance of a unit is covered by the sustained fire of the neighbouring ones, with a view to disturbing the aim of the defenders and keeping them below their cover. For a similar reason the infantry advances are accompanied by bursts of rapid artillery fire from the attackers guns, firing perhaps over their heads from the rear, or from a flank.

If the terrain is open there comes sooner or later a point beyond which the infantry advance cannot be sustained under the aimed fire of the defenders. Heavy losses have probably supervened and the attempt to make them good by reinforcement across open ground only leads to further loss and to further demoralization. The slightest movement, even of individuals, in the attacking line calls forth

* General De Negrier. "Some Lessons of the Russo-Japanese War," translated in the Journal of the R.U.S.I. from the *Revue des Deux Mondes*.

an outburst of rifle fire, and those who are lying prone in the open without cover find themselves unable to move either forward or backward. Under these circumstances the advance comes to a standstill, the men remain prostrate till nightfall brings the opportunity for retirement.

It is evident that if the attacking troops have been trained and equipped in such a manner that the men are able to throw up cover for themselves while lying down, they possess a great advantage. If further, instead of retiring at nightfall their organization and tactical training are such that reinforcements are pushed forward as soon as darkness allows of it to secure the ground gained, to connect the isolated pits into a continuous trench and to excavate trenches of communication from the rear, a distinct advance will have been achieved, and a base gained for the resumption of the attack the next day.

Even if the volume of the defenders' fire and the want of cover between the trench thus made and the enemy's position make an advance from the trench impossible, yet the establishment of a strong firing line under cover in this position will consist considerably in establishing that fire superiority by which alone the conflict will be decided.

In such a case the pressure brought about by the establishment of this strong firing line will in all probability facilitate an advance by some neighbouring body of troops who in their turn may be able to seize and similarly entrench a position whence a powerful fire may be directed on to the enemy's works. If communicating trenches from the rear are constructed at night fresh rifles can be brought up into the firing line, losses made good, water, food and ammunition supplied even in daylight during the progress of the fight. If the lines of firing trench established by the attackers are situated so as to envelope, even if only slightly, those of the defenders, the development of superior fire effect will be greatly facilitated. With the aid of accurate rapid fire from the Q. F. batteries firing perhaps over the heads of the attacking infantry it will probably be possible to break down the defenders' resistance and cast them below their parapets, and thus permit of further advances by short rushes from some parts of the attacking line. In this manner positions still further in advance can be reached, and a connected and gradually established line of positions, or even a series of works, and the defenders subdued, and that which was at first a purely defensible position becomes an offensive position.

The more we consider the position in which the attack must be conducted, in modern times, the more we recognize the possibilities that are open to troops who are suitably equipped and thoroughly trained for the employment of entrenchment in that operation. Our Manual of Infantry is, I judge, probably the best of its kind in any language, it is, thus, the best type of an offensive battle as a method of progression from point to point, each successive

capture weakening the enemy's hold on his main position, and paving the way for a final decisive advance; each successive advance being deliberately prepared and systematically carried out." Again we are told that "it will, as a rule, be necessary for the troops to secure one point of vantage before they attack the next," and the tactical plan recommended as the most suitable for the attack of the enemy in position is as follows: "To outflank at least one of the enemy's wings; to seize localities from which a searching and sustained fire may be developed against a weak point of the position; to strike at that point heavily, unexpectedly, and in the greatest strength possible; and elsewhere to establish bodies of infantry so close to the enemy's line as to hold him to his ground and to prevent him from either changing front, or from reinforcing the troops defending the line of attack."^{*}

The great assistance that entrenchments will afford in the above described methods of attack hardly requires demonstration. Examples have been given in the foregoing pages of their employment to establish bodies of infantry close to the enemy's line in order to hold him to his ground and prevent him altering his dispositions to meet the main attack. For securing each point of vantage acquired in the course of the battle and in the deliberate preparation for the next advance they are equally valuable.

Since the wars which have been dealt with in the previous portion of this essay, the infantry weapon has remained practically unaltered, but that of the artillery has undergone a change which has greatly modified the tactics of that arm, and may conceivably influence those of the others. The change referred to is the introduction in the principal European armies, including our own, of the quick-firing, barrel-recoiling, shield-protected field gun.

One of the probable effects of this weapon will be to make battles even slower and longer than the recent wars proved them to be. The power possessed by the new artillery of suddenly concentrating an extremely rapid fire of shrapnel upon any body of troops who may expose themselves, even for a short time, will force the attacking infantry to display particular care not to afford a target; it will lead to an even more careful use of cover than before and will make a reliance on entrenchment even more necessary. The tendency for advances to be made by night in order without loss to approach the objective will probably increase. On the other hand, it should be remembered that the advantages conferred by these new weapons will not be all on the side of the defence. If ever they are able correctly to locate a portion of the defender's position, the attackers' guns will be able to pour on it for a short time such a hail of projectiles that the occupants of the trenches, unless protected by overhead cover, will certainly be unable to use their rifles against the advancing infantry. The possibility of

Changes in tactical conditions since the last war.

^{*} Combined Training, s. 110.

concealing defensive works depends on the nature of the terrain and the atmospheric conditions. These will not be as favourable for this purpose as they were in South Africa. In such cases, the attacking guns will be able to exercise a very powerful effect.

The nature of the ground and the configuration of the battle-field will naturally have an influence on the tactics of the attack and the possibility of employing entrenchment therein. In Manchuria the methods adopted in the flat highly cultivated plains on the west of the Japanese direction of advance must have differed from those in the stony mountains on the east: the soft undulating soil and moist atmosphere of England and the wide cultivated plains of parts of Continental Europe would offer different problems from those which presented themselves to soldiers warring on the hard yeldt abrupt kopjes and in the dry clear air of South Africa. The passes of the Hindu Kush and the stony valleys of the Helmund, if ever we are called to fight for them, will present yet different conditions.

Very enclosed or woody countries require different methods of fortification from the ordinary and necessitate different tools. Hedgerows are very easy to make defensible and often give ample cover and concealment as they stand, all that is required being to make openings through which the rifle can be used. The cutting down of the hedge or any action that will advertise the fact that it is occupied is of course above all things to be avoided. Fighting in enclosed country in many ways presents features entirely different from those of operations in open country and it is a wise decision that has brought about manœuvres for the army in England in such country in recent years. Although facilities for unobserved advances and for the use of cover are afforded by the hedgerows and the undulations of the ground yet these very features allow of unpleasant surprises and local counter-attacks being delivered by the defenders. Moreover the difficulty of ascertaining the defenders' position and of knowing what your own side are doing has a very disconcerting effect.

In mountain warfare the nature of the work will often preclude altogether the construction of entrenchments toward the attack and the burden of a heavy entrenching tool in addition to the rifle and equipment may prove a great inconvenience in steep climbing work. In such cases however the hills are generally covered with stone rocks and boulders which if not large enough to give cover and defence can easily be built up into low walls or angars. Such shelters if properly constructed give just as much cover against rifle and shrapnel bullets as a trench or pit.

There is every reason to believe that at the present day the system of fighting is generally treated in the light of attacking existing cover with a view to the attack and when none exists, the making of it for oneself by well-organized and trained troops will probably follow a system of the exposure

of adapting his methods to the conditions of whatever country he may be called upon to operate in. The proper training is an even more important matter than the nature of the tools, but before proceeding to it, it is necessary to enter in some further detail into the question of the actual manner of performing the entrenching work, and as this is inseparably bound up with the question of the nature and mode of carriage of the necessary tools, the latter question must be considered first.

Nature and mode of carriage of entrenching tools.

It is quite evident that if the only tools with which an army is provided are situated on the Corps or Divisional dépôt, it will hardly be practicable to employ entrenchment in the attack at all. The desirability of providing an entrenching tool as part of the personal equipment of the infantry soldier began to be recognized soon after the Russo-Turkish War of 1877-78. We have already seen how Skobelev made every man of his division during the march to Constantinople carry slung on his back a full sized shovel, the weight of which was over 7 lbs. The burden and encumbrance of such a tool must, however, have considerably reduced the marching power of the men. Modern war makes greater demands upon the endurance of the soldier than used to be the case; the tendency of the present day is to reduce as far as possible the load carried by the men, and in our army we have gone further in this direction than any of the continental nations. To burden and encumber the soldier with a heavy tool, and so increase the already difficult task of bringing him fit and fresh to the point of contact, would probably be a greater disadvantage than to have him without an entrenching tool when advancing to the attack.

The Turkish system, as already described, consisted in carrying the tools on regimental pack horses. This system is in many respects a good one, but, though it may have answered well in 1877, it is doubtful whether it completely fulfils the requirements of the present day. Widely extended battle formations have now to be taken up at a much greater distance from the enemy than formerly. Pack horses could not accompany the troops into effective musketry range, where the tools would be wanted, and tools cannot be issued to men once they have taken up extended order. If it were intended to entrench in the attack, the issue of the tools would have to take place at a very early stage in the operations. Again, advanced guards and flank guards move now-a-days at a much greater distance from the force they cover; the flanking parties may be scrambling along hill tops far away from the road on which the main body is moving. If there were any chance of their wanting tools they would have to carry them from the start. Lastly, it is often impossible to foresee when any body of troops, particularly a small one, might not be thrown on the defensive, and would require tools to throw up defensive cover. Everything therefore shows that the necessity is

even greater than formerly for every infantry soldier to carry an entrenching tool on his person at all times.

It is essential that if a tool is to be carried on the person of the soldier it must be as light as possible in weight so as to add as little as possible to his burden; and it must be of such a length and shape and attached in such a manner to his equipment, that it will not interfere with his movements in marching, and will not impede him in the use of his rifle in all positions including when lying down. It is evident that ordinary full-sized picks and shovels would not fulfil these conditions. For many years past efforts have been made in the British and some Continental armies to devise tools that would be sufficiently light and portable for the purpose. Another drawback to the ordinary tools is that to dig in normal soils requires the use of both pick and shovel. A soldier, however, cannot carry two tools and also use his rifle, so two men are required to dig. With the wide extensions of the present day this may often give rise to great difficulties owing to the separation of the man carrying the pick from the one with the shovel. Efforts have therefore also been made to design an instrument which would combine in itself the functions both of pick and shovel.

After several trials a tool called the Wallace entrenching implement was introduced in the British service (Home army), and issued to the infantry as a part of the soldier's personal equipment. This instrument the construction of which showed much ingenuity, was a combination of shovel, pick, and grubber; it weighed 21 lbs. 3 oz. and was attached to the soldier's accoutrement by a leather loop. Practical experience, however, after a short time showed that it was impossible to carry the Wallace entrenching implement without interference with the soldier's movements when marching or with the use of his rifle when firing. All efforts to remedy this defect having failed, this implement was withdrawn.

After a while another form of portable entrenching tool was introduced. This consisted of a light pick and a light shovel which were issued in the proportion of 32 shovels and 16 picks per infantry company. These tools were carried in a leather bag slung on the waist belt. The shovel weighed 21 lbs. 2 oz. and was 2 feet 11 inches long over all, and the pick the head of which was pointed at one end and of an axe shape at the other was 2 lbs. 9 oz. in weight, and 1 foot 10 inches in length. These were the tools taken by the troops to South Africa, which, as already narrated, were speedily found to be too light and weak for use in the hard and stony soil of that country, and were then for the most part discarded.

In addition to the portable tools described above, an infantry battery on the war in South Africa was equipped with 20 heavy picks and 20 heavy shovels which were carried in the regimental transport. The picks had a 6½ inch head and a 2½ foot shaft with

Heavy tools in the British service.

helve nearly 8lbs., and the shovel weighed 5lbs. 4oz. This number was so small that these tools were only useful for camp work, and when entrenching had to be done, tools had to be obtained on indent from the R. E. Field Park which formed part of the Corps Troops.

After the abolition of the portable entrenching tools a General Service shovel weighing 3½lbs. was introduced into the Home service, and also a pick with 4½lbs. head, but with a heavy helve bringing its total weight still up to 8lbs. Each battalion now carries in its transport 222 of these shovels and 148 of the picks, and is therefore equipped to carry out entrenching work of some magnitude without having to draw on the R. E. Field Park. In addition to the battalion tools each infantry brigade carries a reserve of 80 picks and 120 shovels. The battalion tools are carried on two tool carts and eight pack animals, (*i.e.*, one per company), and the brigade reserve in one G. S. wagon. The Company pack animals will march immediately in rear of each Company, and in action will follow their companies as closely as the enemy's fire will admit. From this distribution it may be inferred that the principle of having portable tools as part of the soldier's personal equipment has in the Home service, for the present at all events, been abandoned, and that it is intended that the present pattern of pick and G. S. shovel shall be used in the attack.

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The 3½lb. G. S. shovel with which the infantry are equipped has a handle of the same length as the R. E. shovel, and is therefore a convenient tool to use. Its head however is only 9 inches long and 8 inches wide and is distinctly weaker, so it would not stand such heavy work. Still, on the whole, it is a good tool and equal to most ordinary work. The disadvantages for digging purposes of its lesser weight and strength are probably counterbalanced by the reduction in the load borne by the soldier, who, having no portable tool, as already pointed out, often has to carry this shovel for a considerable distance from the point where the tools are issued from the transport animals. It also requires less transport than the heavy shovel.

The pick, weighing with its helve 8lbs., is undoubtedly a heavy article to carry, but picks are intended to break up hard soils, and experience shows that anything lighter will fail to effect this and is liable to bend or break.

In the Indian service there is likewise no portable implement, and each infantry battalion carries in the regimental transport 40 heavy picks and 40 heavy shovels. The former have 6½lb. heads, and with helve weigh 8lbs.; and the latter weigh 7lbs. The number is too small for use if the battalion requires to entrench itself, either for defence or attack, and the tools are too heavy to be carried when the rifle has also to be used. Tools for entrenching work have to be drawn from the Engineer Field Park, which under the Indian organization forms part of the divisional troops, and is therefore rather easier of access than under the army corps system in which the Home army was till recently organized for war. The supply of tools however which is carried by the Engineer Field Park in India is entirely inadequate for the wants of a division if entrenching is necessary on any large scale, for the picks and shovels therein number only 200 of each, not much more than is now allotted to a single battalion in the Home service.* On the whole, therefore, it is not too much to say that the Indian army, as at present equipped, is unable to employ entrenchment in the attack in the manner which recent wars shew it to be advantageous.

Several foreign nations have similarly been engaged on the consideration of the most suitable equipment of entrenching tools. The results have in most cases been the adoption of an equipment of light picks and shovels carried on the person for a certain proportion of the men in the ranks, with a small number of heavy tools as a battalion reserve carried on the regimental transport. Thus the Russians in the late war provided 80 small shovels and 20 light axes to each company of approximately 250 men, and 64 heavy shovels, 12 pickaxes, 12 mattocks and 32 heavy axes per battalion carried in the transport. The Japanese company of 217 men carried 68 light shovels, 17 picks, 17 hatchets and a few saws and wire cutters. Their battalion reserve was 48 shovels, 16 picks and 8 hatchets. As a consequence of the experience of the Russo-Japanese war the French army, in which the equipment previously was only 8 shovels and 8 picks per company (of approximately 250 men) have now increased it to 112 small shovels and 32 picks per company.†

* As there is no system by which changes in the equipment and organization of foreign armies are officially made known to officers of the British army, and as the writer is serving at a distance from centres where such information might be obtained, he has been unable to ascertain whether this equipment is carried on the person of the soldier or on the transport.

† Infantry Training, s. 176.

It will be seen from what has been said previously that a consideration of the most suitable equipment for the employment of entrenchment in the attack is beset with considerable difficulties.

Difficulties of devising a suitable entrenching tool.

A tool that is small enough and light enough to be carried on the person without inconvenience is too weak and light for practical use for digging trenches, and *vice versa*. The solution arrived at in the Home service, namely to abandon the idea of personal equipment, and to provide a fairly large number of full sized and medium weight tools in the regimental transport does not seem to be entirely satisfactory. Although it is laid down * that on the march the eight pack animals carrying the tools will march one in rear of each company, and that in action they will keep as close to their companies as the enemy's fire will admit, yet it is difficult to see how the tools can be distributed to the men when extended and under fire on open ground. There will probably therefore be many cases where they must either be carried for a considerable distance or be dispensed with entirely. When taken over by the men they must be carried in the hand, and when the rifle has to be used the tool must be put on the ground. In the subsequent advance it may very likely be forgotten and left behind.

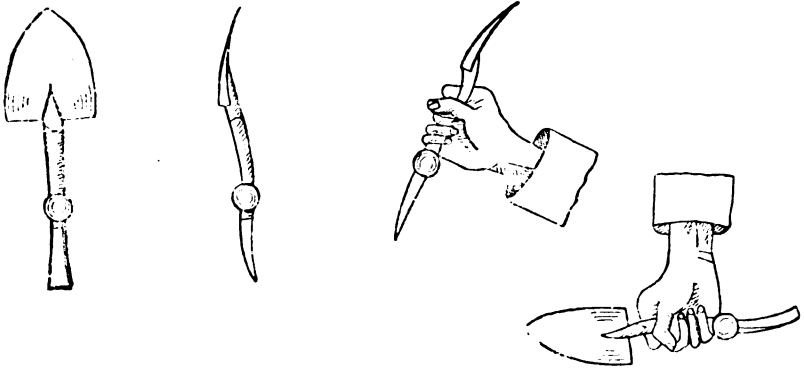
There is yet another objection to which reference has not been made. Although the length of these tools is convenient for digging standing, yet they are certainly too cumbrous for digging lying down. Moreover with a shovel alone it would often be impossible to break up hard soils. Digging in a standing position is impossible within effective range of the enemy, yet it is very desirable to have some means of throwing up cover at that stage of the attack. The main objection that has been advanced against portable tools is their ineffectiveness for deliberate entrenching work. Many people who have had experience of their use stigmatize them as toys; and combination tools in particular are generally said to fail to fulfil any of the purposes for which they are designed.

This is undoubtedly true if we regard them from the point of view of their use for deliberate heavy work standing. To use a short light tool standing is a back-breaking business, and the force that has to be put into it if reasonable progress is to be made will probably break or bend it. It is, however, probable that such implements would be most useful to enable a soldier to grub up head cover when lying down, and, if used exclusively for such work, and not required to take the place of a full-sized pick and shovel, they might be found valuable articles of equipment and quite worth the slight addition they cause to the load.

* It is uncertain whether this number is still correct, as it is understood that a new issue of the Field Service Regulations for the Engineer Services is under preparation but at time of writing this was not obtainable.

The fact appears to be that we have all this time been trying to make one instrument fulfil two distinct and antagonistic functions. What the conditions of modern war seem to call for are, firstly, on the soldier's person, a very light short implement, with which he could scrape or grub up cover when lying down under fire, and secondly, in the regimental transport, a supply of full sized picks and shovels for digging continuous trenches. The latter would be used by the supporting troops for improving and connecting into trenches the small pits made by the firing line ; for entrenching positions that have been seized during the course of a battle, and which are not for the moment under the enemy's fire ; for all work at night, which will in future form a larger feature of the battle than ever, and also for defensive works.

Each of these two classes of implement could be designed solely for the purpose for which it is required. The portable grubbing implement. The portable implement might have a small but strong shovel or trowel-shaped blade, with a short handle and a steel pick point at the other end of the handle. Such an implement could be grasped dagger-wise and the



pointed end used with an overhand motion for breaking into the ground. By using it with an underhand motion the shovel end could be used to scoop or shovel up the loosened soil. A tool of this nature would be about 15 or 16 inches long over all and would weigh very little. It could be carried without difficulty in a frog attached to the waistbelt.

The above is merely a tentative suggestion, not based on any practical experiment, the result of which would doubtless show that the pattern suggested could be greatly improved on. It might, in fact, be found that an implement like a miniature *mamootie* or *phowrah* would be the best solution, and experiments have recently been made at the School of Military Engineering, Chatham, with an adze-shaped tool, which must have been something of this description.

This shape, however, would be less convenient to carry than the one above suggested.

Before any definite pattern could be decided on, an extended series of trials would be required to test the capabilities of the proposed implement in various classes of soil, and to ascertain whether it constitutes an encumbrance to the soldier. Above all things it must be remembered that it is intended solely for the provision of light cover by men lying down, and is in no way a substitute for the pick and shovel. There would however be little fear of this being forgotten if once such a tool were issued to the army, for, with an implement of this nature, it would be impossible to dig standing.

If a portable implement were introduced every man in the ranks should be equipped with one. It would however still be necessary to have in addition an equipment of picks and shovels carried in the regimental transport, and it would be undesirable to reduce the proportion of the latter below that now allowed in the home service, as this number is none too much for the work that would be necessary to secure positions gained, to make communications from the rear, etc. As every man would have at all times means of covering himself under fire, the picks and shovels would only be issued to working parties definitely told off for the above purposes. They would not have to be carried about for long periods, so there would be no necessity to sacrifice strength to lightness in their design, which should be the most suitable obtainable for solid digging. It would therefore be preferable to provide infantry with the 5lb. R. E. shovel instead of the 3½lb. G. S. pattern. The only objection to this would be on the score of the increased weight to be carried in the regimental transport, but this would amount all told to only three mules per battalion at the most, over and above the number that would be required to carry an equal number of the lighter tools.

It will have been noticed that the proportion of picks to shovels provided in the Home service is as two to three. In the case however of the army in India, where the soil of the most probable theatre of war is of a hard and generally stony nature, it would be undesirable to have a smaller proportion of picks than of shovels. It is probable that an equipment of approximately 240 shovels and 240 picks per battalion would be suitable, as this would practically allow of three companies forming a working party, each man with a pick and shovel; or, when very rapid work was required, six companies could be employed, two men to each task with a pick and shovel between them. As each man would have an implement on his person it would suffice if the picks and shovels were a battalion reserve instead of a company equipment as it is in the Home service, and they could be carried on mules in the battalion transport.

Full sized picks and shovels for making trenches.

Proportion of full sized tools.

an outburst of rifle fire, and those who are lying prone in the open without cover find themselves unable to move either forward or backward. Under these circumstances the advance comes to a standstill, the men remain prostrate till nightfall brings the opportunity for retirement.

It is evident that if the attacking troops have been trained and equipped in such a manner that the men are able to throw up cover for themselves while lying down, they possess a great advantage. If further, instead of retiring at nightfall their organization and tactical training are such that reinforcements are pushed forward as soon as darkness allows of it to secure the ground gained, to connect the isolated pits into a continuous trench and to excavate trenches of communication from the rear, a distinct advance will have been achieved, and a base gained for the resumption of the attack the next day.

**Advantage conferred
by entrenchment under
these conditions.**

Even if the volume of the defenders' fire and the want of cover between the trench thus made and the enemy's position make an advance from the trench impossible, yet the establishment of a strong firing line under cover in this position will consist considerably in establishing that fire superiority by which alone the conflict will be decided.

In such a case the pressure brought about by the establishment of this strong firing line will in all probability facilitate an advance by some neighbouring body of troops who in their turn may be able to seize and similarly entrench a position whence a powerful fire may be directed on to the enemy's works. If communicating trenches from the rear are constructed at night fresh rifles can be brought up into the firing line, losses made, food, water, food and ammunition supplied even in daylight during the progress of the fight. If the lines of firing trench established by the attackers are situated so as to envelop even if only slightly those of the defenders, the development of superior fire effect will be greatly facilitated. With the aid of accurate rapid fire from the Q. F. batteries firing perhaps over the heads of the attacking infantry it will probably be possible to break down the defenders' resistance and confine them below their parapets, and thus permit of further advances by short rushes from some parts of the attacking line. In this manner positions still further in advance can be reached and entrenched, and gradually a line established which prevents the enemy's works, and therefore his resistance, and that which he can do is practically nil.

The next we consider the problem of how with the attack must be carried on in order that success may be won, given the possibilities that are open to troops who are suitably equipped and thoroughly trained for the employment of entrenchment in that operation. Our Manual of Cavalry and Light Infantry probably the best of its kind in any language, tells us that "the best position for successive batteries is a methodical progression from point to point, each successive

capture weakening the enemy's hold on his main position, and paving the way for a final decisive advance; each successive advance being deliberately prepared and systematically carried out." Again we are told that "it will, as a rule, be necessary for the troops to secure one point of vantage before they attack the next," and the tactical plan recommended as the most suitable for the attack of the enemy in position is as follows: "To outflank at least one of the enemy's wings; to seize localities from which a searching and sustained fire may be developed against a weak point of the position; to strike at that point heavily, unexpectedly, and in the greatest strength possible; and elsewhere to establish bodies of infantry so close to the enemy's line as to hold him to his ground and to prevent him from either changing front, or from reinforcing the troops defending the line of attack."*

The great assistance that entrenchments will afford in the above described methods of attack hardly requires demonstration. Examples have been given in the foregoing pages of their employment to establish bodies of infantry close to the enemy's line in order to hold him to his ground and prevent him altering his dispositions to meet the main attack. For securing each point of vantage acquired in the course of the battle and in the deliberate preparation for the next advance they are equally valuable.

Since the wars which have been dealt with in the previous portion of this essay, the infantry weapon has remained practically unaltered, but that of the artillery has undergone a change which has greatly modified the tactics of that arm, and may conceivably influence those of the others. The change referred to is the introduction in the principal European armies, including our own, of the quick-firing, barrel-recoiling, shield-protected field gun.

One of the probable effects of this weapon will be to make battles even slower and longer than the recent wars proved them to be. The power possessed by the new artillery of suddenly concentrating an extremely rapid fire of shrapnel upon any body of troops who may expose themselves, even for a short time, will force the attacking infantry to display particular care not to afford a target; it will lead to an even more careful use of cover than before and will make a reliance on entrenchment even more necessary. The tendency for advances to be made by night in order without loss to approach the objective will probably increase. On the other hand, it should be remembered that the advantages conferred by these new weapons will not be all on the side of the defence. If ever they are able correctly to locate a portion of the defender's position, the attackers' guns will be able to pour on it for a short time such a hail of projectiles that the occupants of the trenches, unless protected by overhead cover, will certainly be unable to use their rifles against the advancing infantry. The possibility of

Changes in tactical conditions since the last war.

* Combined Training, s. 110.

concealing defensive works depends on the nature of the terrain and the atmospheric conditions. These will not be as favourable for this purpose as they were in South Africa. In such cases the attacking guns will be able to exercise a very powerful effect.

The nature of the ground and the configuration of the battle-field will naturally have an influence on the tactics of the attack and the possibility of employing entrenchment therein. In Manchuria the methods adopted in the flat highly cultivated plains on the west of the Japanese direction of advance must have differed from those in the stony mountains on the east, the soft undulating soil and moist atmosphere of England, and the wide cultivated plains of parts of Continental Europe would offer different problems from those which presented themselves to soldiers warring on the hard yeldt abrupt kopjes and in the dry clear air of South Africa. The passes of the Hindu Kush and the stony valleys of the Helmund, if ever we are called to fight for them will present yet different conditions.

Very enclosed or woody countries require different methods of fortification from the ordinary and necessitate different tools. Hedgerows are very easy to make defensible and often give ample cover and concealment as they stand, all that is required being to make openings through which the rifle can be used. The cutting down of the hedge or any action that will advertise the fact that it is occupied is of course above all things to be avoided. Fighting in enclosed country in many ways presents features entirely different from those of operations in open country and it is a wise decision that has brought about manoeuvres for the army in England in such country in recent years. Although facilities for unobserved advances and for the use of cover are afforded by the hedgerows and the undulations of the ground yet these very features allow of unpleasant surprises and local counter attacks being delivered by the defenders. Moreover the difficulty of ascertaining the defender's position and of knowing what your own side are doing has a very disconcerting effect.

In mountain warfare the nature of the soil will often preclude altogether the construction of entrenchments to aid the attack and the burden of a heavy entrenching tool in addition to the rifle and equipment may prove a great embarrassment in steepest climbing work. In such cases however the hills are generally covered with overhanging rocks and boulders which afford excellent cover to give cover and cover can easily be built upon the crevices of crags. Such shelters if properly constructed give just as much cover against rifle and sharpshooters as a trench or pit.

There is every reason to believe that the soldier of the present day being sent to a very different ground from that of the soldier of the past is going to have to contend with a different set of conditions. The nature of the ground and the atmospheric conditions will be different and will require a different set of tools and a different set of tactics. The soldier of the future will have to be prepared to contend with a different set of conditions.

of adapting his methods to the conditions of whatever country he may be called upon to operate in. The proper training is an even more important matter than the nature of the tools, but before proceeding to it, it is necessary to enter in some further detail into the question of the actual manner of performing the entrenching work, and as this is inseparably bound up with the question of the nature and mode of carriage of the necessary tools, the latter question must be considered first.

Nature and mode of carriage of entrenching tools.

It is quite evident that if the only tools with which an army is provided are situated on the Corps or Divisional dépôt, it will hardly be practicable to employ entrenchment in the attack at all. The desirability of providing an entrenching tool as part of the personal equipment of the infantry soldier began to be recognized soon after the Russo-Turkish War of 1877-78. We have already seen how Skobelev made every man of his division during the march to Constantinople carry slung on his back a full sized shovel, the weight of which was over 7 lbs. The burden and encumbrance of such a tool must, however, have considerably reduced the marching power of the men. Modern war makes greater demands upon the endurance of the soldier than used to be the case: the tendency of the present day is to reduce as far as possible the load carried by the men, and in our army we have gone further in this direction than any of the continental nations. To burden and encumber the soldier with a heavy tool, and so increase the already difficult task of bringing him fit and fresh to the point of contact, would probably be a greater disadvantage than to have him without an entrenching tool when advancing to the attack.

The Turkish system, as already described, consisted in carrying the tools on regimental pack horses. This system is in many respects a good one, but, though it may have answered well in 1877, it is doubtful whether it completely fulfils the requirements of the present day. Widely extended battle formations have now to be taken up at a much greater distance from the enemy than formerly. Pack horses could not accompany the troops into effective musketry range, where the tools would be wanted, and tools cannot be issued to men once they have taken up extended order. If it were intended to entrench in the attack, the issue of the tools would have to take place at a very early stage in the operations. Again, advanced guards and flank guards move now-a-days at a much greater distance from the force they cover: the flanking parties may be scrambling along hill tops far away from the road on which the main body is moving. If there were any chance of their wanting tools they would have to carry them from the start. Lastly, it is often impossible to foresee when any body of troops, particularly a small one, might not be thrown on the defensive, and would require tools to throw up defensive cover. Everything therefore shows that the necessity is

even greater than formerly for every infantry soldier to carry an entrenching tool on his person at all times.

It is essential that if a tool is to be carried on the person of the soldier it must be as light as possible in weight so as to add as little as possible to his burden; and it must be of such a length and shape and attached in such a manner to his equipment, that it will not interfere with his movements in marching and will not impede him in the use of his rifle in all positions including when lying down. It is evident that ordinary full-sized picks and shovels would not fulfil these conditions. For many years past efforts have been made in the British and some Continental armies to devise tools that would be sufficiently light and portable for the purpose. Another drawback to the ordinary tools is that to dig in normal soils requires the use of both pick and shovel. A soldier however cannot carry two tools and also use his rifle, so two men are required to dig. With the wide extensions of the present day this may often give rise to great difficulties owing to the separation of the man carrying the pick from the one with the shovel. Efforts have therefore also been made to design an instrument which would combine in itself the functions both of pick and shovel.

Essential requirements for portable tools

After several trials a tool called the Wallace entrenching implement was introduced in the British service (Home army) and issued to the infantry as a part of the soldier's personal equipment. This instrument the construction of which showed much ingenuity, was a combination of shovel, pick, and grubber; it weighed 21 lbs. 3 oz. and was attached to the soldier's accoutrement by a leather loop. Practical experience however after a short time showed that it was impossible to carry the Wallace entrenching implement without interference with the soldier's movements when marching or with the use of his rifle when firing. An effort to remedy this defect having failed this implement was withdrawn.

Portable implements tried in the British service

After a while another form of portable entrenching tool was introduced. This consisted of a light pick and a light shovel which were issued in the proportion of 32 shovels and 16 picks per infantry company. These tools were carried in a leather frog slung on the waist belt. The shovel weighed 2 lbs. 2 oz. and was 2 feet 11 inches long over all and the pick the head of which was pointed at one end and of an axe shape at the other was 2 lbs. 9 oz. in total weight and 1 foot 10 inches in length. These were the tools taken by the troops to South Africa which as already pointed out were speedily found to be too light and weak for use in the hard and stony soil of that country and were therefore discarded.

In addition to the portable tools described above a certain quantity of heavy tools in the British service. A battalion in the war in South Africa was equipped with 20 heavy picks and 20 heavy shovels which were carried in the regular transport. The picks had a length of 4 feet 6 inches and weighed with

helve nearly 8lbs., and the shovel weighed 5lbs. 4oz. This number was so small that these tools were only useful for camp work, and when entrenching had to be done, tools had to be obtained on indent from the R. E. Field Park which formed part of the Corps Troops.

After the abolition of the portable entrenching tools a General Service shovel weighing $3\frac{1}{2}$ lbs. was introduced into the Home service, and also a pick with $4\frac{1}{2}$ lbs. head, but with a heavy helve bringing its total weight still up to 8lbs. Each battalion now carries in its transport 222 of these shovels and 148 of the picks, and is therefore equipped to carry out entrenching work of some magnitude without having to draw on the R. E. Field Park. In addition to the battalion tools each infantry brigade carries a reserve of 80 picks and 120 shovels. The battalion tools are carried on two tool carts and eight pack animals, (*i.e.*, one per company), and the brigade reserve in one G. S. wagon. The Company pack animals will march immediately in rear of each Company, and in action will follow their companies as closely as the enemy's fire will admit. From this distribution it may be inferred that the principle of having portable tools as part of the soldier's personal equipment has in the Home service, for the present at all events, been abandoned, and that it is intended that the present pattern of pick and G. S. shovel shall be used in the attack.

All who have had much experience in the supervision of excavation work know that it can be done better, quicker, and with less fatigue to the excavator with a tool of full size and weight than with a short or light one. A navy or experienced digger will always choose to work with full-sized tools in any soil. A short tool entails more stooping to the work and so induces more fatigue, and a light tool requires a greater effort to make it penetrate the ground and is liable to bend or break. In the British service there is a shovel weighing 5lbs., having a handle 2 feet 4 inches long, and a heart-shaped blade 12 inches long and $10\frac{1}{2}$ inches wide. This tool is strong enough for use in very stiff soils and is capable of doing any excavation work that a soldier is likely to be called on to perform. It is carried by the Royal Engineers only.

**Advantages of heavy
over light tools.**

The $3\frac{1}{2}$ lb. G. S. shovel with which the infantry are equipped has a handle of the same length as the R. E. shovel, and is therefore a convenient tool to use. Its head however is only 9 inches long and 8 inches wide and is distinctly weaker, so it would not stand such heavy work. Still, on the whole, it is a good tool and equal to most ordinary work. The disadvantages for digging purposes of its lesser weight and strength are probably counterbalanced by the reduction in the load borne by the soldier, who, having no portable tool, as already pointed out, often has to carry this shovel for a considerable distance from the point where the tools are issued from the transport animals. It also requires less transport than the heavy shovel.

It will be seen from what has been said previously that a consideration of the most suitable equipment for the employment of entrenchment in the attack is beset with considerable difficulties.

Difficulties of devising a suitable entrenching tool.

A tool that is small enough and light enough to be carried on the person without inconvenience is too weak and light for practical use for digging trenches, and *vice versa*. The solution arrived at in the Home service, namely to abandon the idea of personal equipment, and to provide a fairly large number of full sized and medium weight tools in the regimental transport does not seem to be entirely satisfactory. Although it is laid down* that on the march the eight pack animals carrying the tools will march one in rear of each company, and that in action they will keep as close to their companies as the enemy's fire will admit, yet it is difficult to see how the tools can be distributed to the men when extended and under fire on open ground. There will probably therefore be many cases where they must either be carried for a considerable distance or be dispensed with entirely. When taken over by the men they must be carried in the hand, and when the rifle has to be used the tool must be put on the ground. In the subsequent advance it may very likely be forgotten and left behind.

There is yet another objection to which reference has not been made. Although the length of these tools is convenient for digging standing, yet they are certainly too cumbersome for digging lying down. Moreover with a shovel alone it would often be impossible to break up hard soils. Digging in a standing position is impossible within effective range of the enemy, yet it is very desirable to have some means of throwing up cover at that stage of the attack. The main objection that has been advanced against portable tools is their ineffectiveness for deliberate entrenching work. Many people who have had experience of their use stigmatize them as toys; and combination tools in particular are generally said to fail to fulfil any of the purposes for which they are designed.

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The fact appears to be that we have all this time been trying to make one instrument fulfil two distinct and antagonistic functions. What the conditions of modern war seem to call for are, firstly, on the soldier's person a very light short implement, with which he could scrape or grub up cover when lying down under fire, and secondly, in the regimental transport, a supply of full sized picks and shovels for digging continuous trenches. The latter would be used by the supporting troops for improving and connecting into trenches the small pits made by the firing line; for entrenching positions that have been seized during the course of a battle, and which are not for the moment under the enemy's fire; for all work at night, which will in future form a larger feature of the battle than ever, and also for defensive works.

Each of these two classes of implement could be designed solely for the purpose for which it is required. The portable grubbing implement might have a small but strong shovel or trowel shaped blade with a short handle and a steel pick point at the other end of the handle. Such an implement could be grasped digger-wise and the



pointed end used with an overhand motion for breaking into the ground. By using it with an underhand motion the shovel end could be used to scoop or shove up the loosened soil. A tool of this nature would be about 15 or 16 inches long overall and would weigh very little. It could be carried without difficulty in a bag attached to the waist.

The above is merely a tentative suggestion, not based on any practical experiment. The result will be well demonstrated by the fact that the pattern suggested can be greatly improved on. It may in fact be found that an implement of a somewhat different form or shape would be the best. Other practical experiments have recently been made at the School of Military Engineering, Chertsey, with an eye-shaped tool which must have been something of this description.

This shape, however, would be less convenient to carry than the one above suggested.

Before any definite pattern could be decided on, an extended series of trials would be required to test the capabilities of the proposed implement in various classes of soil, and to ascertain whether it constitutes an encumbrance to the soldier. Above all things it must be remembered that it is intended solely for the provision of light cover by men lying down, and is in no way a substitute for the pick and shovel. There would however be little fear of this being forgotten if once such a tool were issued to the army, for, with an implement of this nature, it would be impossible to dig standing.

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Full sized picks and shovels for making trenches.

Proportion of full sized tools.

*Training the soldier in the employment of entrenchment
in the attack.*

Having now formulated suggestions as to the most suitable equipment of tools, it is desirable to consider the important question of the training of the soldier in their use and in the habit of employing entrenchment in the attack. We have seen how in prolonged campaigns the rank and file have come in time to acquire this habit for themselves, but under the conditions of modern weapons, we, with our numerically small army, cannot afford to let our soldiers pick it up in that way, as the price to be paid in the earlier stages of the war would be too great. No training can be omitted that will help to ensure success, and we must arrange that our troops begin their campaigns with the habit of entrenching in the attack firmly implanted in them, and with a knowledge of how to exercise it.

There are two serious obstacles in the way of securing adequate training for the soldier in this work. One is the difficulty in providing suitable ground where it can be practised. This is particularly the case in England, and above all in the case of small garrisons situated in parts of the country where the land is all highly cultivated or to a large extent preserved for game. A good deal has been done to remove this objection by the present practice of locating troops in large garrisons where wide areas for manœuvring purposes have been acquired by the War Office, as at Aldershot and Salisbury Plain, and at those places entrenching work is much more practised than it used to be. In India this difficulty does not prevail to nearly the same degree, as there is nearly always in the vicinity of military cantonments ground where entrenchment could be practised without injuring anyone's rights or incurring expense in damages.

The other obstacle lies in the objection entertained by the soldier himself to labour of this nature. This natural objection is found in most armies but is particularly noticeable in ours on account of the unfortunate but long established tendency to look on all digging work as a "fatigue". This tendency is fostered by the fact that in certain cases when soldiers are employed in digging in peace time they receive extra pay. Although it is clearly laid down that working pay is not to be granted for instructional work, nor in the field for any work, yet it is natural that it should be felt a hardship when work has to be done without it. The custom of giving working pay leads the soldier to believe that digging work is something outside his ordinary military duties.

This idea must be eradicated. The soldier must be taught from the time he joins that digging, whether in throwing up light entrenchments, constructing defensive works, making roads of communication, or in any other service for the good of the army, is as honourable and necessary a part of the soldier's trade as

Difficulties in securing training.

Abolition of working pay for digging work.

any other. To this end it is desirable to abolish working pay altogether. If this were going to lead to any appreciable reduction of the soldier's emoluments, it would be better to make it up to him in pay than to continue such a system, but by far the greater majority of men have so few opportunities of earning working pay that it will make no difference to them whatever. Whether the soldier should ever be employed on public works when working pay has been abolished is a question for consideration. To employ him in this manner for the purpose of saving money to the exchequer is most undesirable, but if the execution of certain public works gives him a needed instruction and practice in digging, there would be no reason why he should not be so employed in moderation, except that such work is liable to be unpopular, and it is above all things desirable to avoid anything that will cause a distaste for spade work. On the whole, therefore, it would be better not to employ soldiers on work of that sort.

The soldier requires training both in the technical work of digging with the service tools and the tactical art of employing entrenchments in the attack across country. For this the present system

Nature of training required.

by which instruction in entrenching is only one of the many items to be crammed into 36 days annual company training cannot be considered sufficient. The technical instructions should begin soon after he joins, and a course of digging should form part of every recruit's curriculum. For this purpose it would be desirable to have in the neighbourhood of all barracks a field or enclosure where such work could be done. A man cannot dig effectively without training and practice; any one who has superintended a course of instruction in field works, or better still, who has undergone one in person, knows the physical distress which a couple of hours' digging will bring about in an untrained man. The hands have to be hardened and the muscles of the body exercised. The method of swinging the pick, thrusting with the shovel and throwing the earth to the front requires to be taught. A man cannot be considered a fully trained soldier until he can dig steadily for four hours without distress in ordinary soil. The tasks specified in the Manual of Military Engineering, namely 30 c.ft. in one hour and 80 c.ft. in four hours,* are for untrained men. A trained man should be able to dig 120 c.ft. in four hours, and as the time available to entrench a position seized in the attack will often be very short, it is desirable to train the men up to the latter standard if practicable. Practice would also be necessary at digging, lying down with the small grubbing implement, if an article of that description were introduced. In light easy soil trained men might be expected to conceal themselves completely by its means in about half an hour.

* Manual of Military Engineering, s. 21.

The tactical training in the employment of entrenchment in the attack must be part of the soldier's ordinary tactical training in practical skirmishing. The Training Manual already provides for the instruction of the soldier in the use of natural cover in the attack.* The use of the entrenching implement to improvise cover where it does not naturally exist is merely a corollary of what is there laid down.

Above all practice is requisite. Whether the training is that of the company, or of the battalion, or the ordinary work of a field day, troops engaged in attacking operations should invariably use their entrenching implements. The picks and shovels on the battalion transport animals should be taken into the field at all manoeuvres, and whenever it is necessary to secure a position, the entrenchment should actually be thrown up. Whatever may be the nature of the entrenching implements that are eventually introduced into the Indian army, it is essential that they are regularly made use of by the troops when they are practising the attack in peace time.

In this manner the habit will be inculcated of throwing up cover whenever necessary and of looking upon the entrenching tool as the necessary companion and partner of the rifle. One of the objections often raised in past times to the use of entrenchments in the attack was that once men had obtained cover in this way from the enemy's fire they could not be prevailed on to leave it for the bullet-swept open ground. This, however, if it was the case, arose from the fact that both officers and men had been taught to regard fortifications as adjuncts solely of the defence. They naturally therefore looked on it as a means of self protection instead of as a means of furthering the offensive action of their own force. When in peace time they had been trained to use entrenchments for passive defence only, it could not be surprising if in war they failed to comprehend their employment actively. If, however, all ranks have been trained to occupy and advance from trenches constantly in peace time they will do the same without hesitation on the battle field.

Another great advantage will accrue to the army at large from the adoption of the habit of using entrenchments in the attack. It will inevitably correct our conceptions of the use of fortification generally in tactical and strategic operations, whether offensive or defensive. It will show to every officer on the subject that between the use of fortification in the attack and its use in the defence there should be no essential difference. War can only be waged with success by others as well as by everything which does not directly contribute to further offensive action is a dangerous impediment. The habit of doing this is the only correct practice. The great main offensive effort is being directed in every case against the enemy's weakest or most vulnerable point. In other parts, awake of the theatre of war and of the battle, the use of the troops

Correction of our ideas of the use of fortification generally by its practice in the attack

* Infantry I & II, p. 21.

are engaged in feints and demonstrations, and some perhaps are passively employed in defence against the enemy's attacks. But if the employment of any is not in some way furthering the main offensive operation, then there is false strategy or faulty tactics.

Many and striking examples can be found in history of the disasters that arise from the wrongful use of fortification, both in the strategy of the campaign and in the tactics of the battle-field. Many commanders have taken to its shelter when their only chance of success lay in a bold offensive. Others, who have rightly adopted it at first, fascinated by the protection it affords, have been seduced into remaining under its cover when it no longer furthered the offensive aim, but had become a fatal net.

Some critics, seeing the disastrous results of such action, have loudly proclaimed that fortification is mischievous and fortresses an incubus. But that is wantonly and unnecessarily throwing away a most valuable and sometimes indispensable auxiliary. We require to grasp the fact that fortification is valuable solely as a means of assisting the offence, and that as soon as the occupation of a position ceases to fulfil this end, that position, however strongly fortified, should be abandoned as if the plague were in it. When we have all been trained from the beginning of our military careers to throw up entrenchments whenever we require them, and to vacate them on the instant that we find that we can do more useful work elsewhere to further the offensive aim, then we shall not, when we become leaders, fall into the lamentable errors referred to above.

Practice in the use of fortification to further the attack on the battlefield will teach us its use to further the consummation of a campaign. We shall not fail through forgetfulness or ignorance to employ it wherever it can do good, and we shall not hesitate, when necessary, to abandon a fortified position whatever the amount of muscular effort or of money its fortification has cost. A nation whose soldiers and statesmen invariably act on these principles if it cannot command victory, will at all events be spared the humiliating disasters of Metz, Plevna and Port Arthur.

Having learnt its use in attack we shall know how to employ it rightly in all cases.

POLITICS AND WAR.

The relation of the task of the Statesman to that of the Strategist.

Lecture delivered at the Indian Staff College.

BY CAPTAIN J. CHARTERIS, R.E.

In the time at my disposal, it will only be possible to indicate the more prominent of the many problems involved in the relation of politics and warfare, and to suggest answers to the questions that arise. I was led to select this subject by noting that in almost every military book that I have read, the interference of the politician or statesman was referred to. Generally, the conclusion arrived at was that the interference was unjustifiable, and invariably that it had an adverse influence on the strategy. At first sight the deduction was that the very fact that this influence was adverse proved that it was unjustifiable. That seemed to solve the whole question. Then one remembered that the rulers of countries are generally the most able men that the country possesses, and that if these men had, through successive centuries, insisted on controlling the strategy, there was probably something to be said on their side.

To attempt a solution of this question is, then, the first task I have set myself. In doing so, I refer, of course, to the interference—or control of the great questions of strategy. Interference in matters of detail regarding the operations is, on the face of it, indefensible. An example of such interference is found in the first campaign of Stonewall Jackson in the Shenandoah valley. When Benjamin, the Secretary at Richmond, demanded that Loring's force should be withdrawn from Romney, Jackson promptly sent in his resignation.

Now I think it is very clear that to solve it one must not look only at the actual military operations, but at the whole life of the nation. The statesman is, of course, responsible for this. He controls the nation's destinies in peace, and except against the somewhat rare case of a purely aggressive war against his country he has probably much to say whether there should be war or not. And immediately the war is over the statesman comes again into undivided control of the country's destinies. The war in fact is only an isolated event in the life of the nation, and its success or failure falls to be judged in the light of the effect it has had on this life.

So that if we are going to answer the question whether the interference with the strategist was justifiable or not, by the result of such interference, it should be by the result on the actual history of the nation and not by the mere result of the military operations. I do not for a moment mean to say that the test of success is the only

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in the attack.*

Having now formulated suggestions as to the most suitable equipment of tools, it is desirable to consider the important question of the training of the soldier in their use and in the habit of employing entrenchment in the attack. We have seen how in prolonged campaigns the rank and file have come in time to acquire this habit for themselves, but under the conditions of modern weapons, we, with our numerically small army, cannot afford to let our soldiers pick it up in that way, as the price to be paid in the earlier stages of the war would be too great. No training can be omitted that will help to ensure success, and we must arrange that our troops begin their campaigns with the habit of entrenching in the attack firmly implanted in them, and with a knowledge of how to exercise it.

There are two serious obstacles in the way of securing adequate training for the soldier in this work. One is the difficulty in providing suitable ground where it can be practised. This is particularly the case in England, and above all in the case of small garrisons situated in parts of the country where the land is all highly cultivated or to a large extent preserved for game. A good deal has been done to remove this objection by the present practice of locating troops in large garrisons where wide areas for manoeuvring purposes have been acquired by the War Office, as at Aldershot and Salisbury Plain, and at those places entrenching work is much more practised than it used to be. In India this difficulty does not prevail to nearly the same degree, as there is nearly always in the vicinity of military cantonments ground where entrenchment could be practised without incurring anyone's rights or incurring expense in damages.

The other obstacle lies in the objection entertained by the soldier himself to labour of this nature. This natural objection is found in most armies, but is particularly noticeable in ours on account of the unfortunate but long established tendency to look on all digging work as a 'flogging'. This tendency is fostered by the fact that in certain cases when soldiers are employed in digging in peace time they receive extra pay. Although it is clearly wrong that working pay is not to be granted for instructive work nor in the field for any work yet it is natural that it should be taken as a hardship when work has to be done without it. The custom of giving working pay leads the soldier to believe that digging work is something outside his ordinary military duties.

This idea must be eradicated. Digging must be taken as a part of the soldier's training, and the soldier must be made to understand that it is a part of his military duties. The abolition of working pay for digging work, and the abolition of the flogging for works making roads of communication or in any other sense for the good of the army, is as honourable and necessary a part of the soldier's trade as

any other. To this end it is desirable to abolish working pay altogether. If this were going to lead to any appreciable reduction of the soldier's emoluments, it would be better to make it up to him in pay than to continue such a system, but by far the greater majority of men have so few opportunities of earning working pay that it will make no difference to them whatever. Whether the soldier should ever be employed on public works when working pay has been abolished is a question for consideration. To employ him in this manner for the purpose of saving money to the exchequer is most undesirable, but if the execution of certain public works gives him a needed instruction and practice in digging, there would be no reason why he should not be so employed in moderation, except that such work is liable to be unpopular, and it is above all things desirable to avoid anything that will cause a distaste for spade work. On the whole, therefore, it would be better not to employ soldiers on work of that sort.

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* Infantry Training, s. 51.

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or even the best means of answering the question, but it is the one generally applied. To take a concrete case from history to illustrate my meaning. Criticism has condemned Pitt for his policy during the commencement of the last century. At first he directed all his efforts to breaking down the colonies of France. It is pointed out that the results from a military point of view were mainly negative, and it is claimed that if he had sent a strong force to assist the enemies of the Republic he might have attained great success. But the result of the struggle was to put England in a far stronger position than she had ever before occupied. As Yorck von Wartenburg puts it, while England was quietly annexing colonies and strengthening her sea power, the other European Powers were pulling the chestnuts out of the fire for her on the continent. If Pitt had sent all his forces to take their part in the struggle on the continent there was at least the chance that a bad defeat would have caused her to accept an unfavourable peace; in any case the final results could hardly have been better than they were. So that here the test of result if applied to the history of the nation gives a totally different answer to that of purely military criticism.

But as I said before this test of results is not the best one. It is, I think, a somewhat amateurish way of deciding.

If we look at the question from the broader standpoint of principles, we must take into consideration what are the necessary factors to success both in politics and warfare. Now I think every one must agree that the national spirit is a very important one. Countries no longer make war at the behest of their rulers. It was pointed out in a previous lecture how the fact that the Russians neither knew nor cared what they were fighting for affected their military capabilities, and the convulsions that the life politic in Russia is suffering now are probably largely attributable to a war that was at once unsuccessful and unpopular. I would go even further than this. I do not think that by any country of Europe, except Russia, could an unpopular war have been waged as long as this was. Now it is this influence that the temper of the people has on this result of the war that affords one justification to the politician in retaining his right of interference. There is another justification—no nation can afford to stand alone in the case of a great war. The ring must be kept by defensive alliances. An act that would lead to great results of strategy might well cause political disaster. To take another concrete instance, every history of the War in America points how Lincoln's anxiety for the safety of Washington cramped the strategy of the Federals. But Hay's life of Lincoln points out that there was, at the time, a by-no-means insignificant peace party in the North; the fall of Washington would have been a great handle for them, should the strategists fail. There was also a great danger of foreign intervention. Here were two definite evils that Lincoln could gauge and the advantages of the alternative policy were shrouded in the uncertainty of war. Under the circumstances I do not think we can blame him for retaining in his hands the choice.

But the other side of the shield is no less clear. From the time that Hannibal was refused, by the Council of the Hundred at Carthage, the reinforcements that he required to reduce Rome, history teems with examples where the statesman by undue interference has nullified the results of the strategist: and looking back now, we can see that the strategist was in the right and that the interference has led to disaster. In the recent war a very typical case was the attempt of Stakelberg, for purely political motives, to relieve Port Arthur in the face of an overwhelmingly superior force. So far then the conclusions that can be drawn are that while the interference of statesmen in the war is, to a certain extent, justified by the nature of the relation that war bears to the general policy of the country, such interference has often resulted in disaster. Every one here has read of the constant struggles that Marlborough had to overcome the interference of the politicians both in England and in the Lowlands, and although this did not result in disaster Marlborough was nearly driven to resign his command.

With this conclusion there arises the question whether it is not possible to arrange some scheme whereby the relations of the two great servants of the state, the statesman and the strategist, will be so clearly defined that each, understanding the position and the motive of the other, will loyally co-operate. The first thought that suggests itself is that if the two functions were combined in one man an immediate solution would be obtained. But I think in the history of Napoleon one can trace his position as the head of a state adversely affecting his conduct of wars. It is quite true that his career affords, in the earlier years of his supreme power in the state, a marvellous example of the results that can be obtained by harmonious strategy and statescraft. The constant state of war that existed in Europe lent itself to his plans of making and breaking alliances to suit strategy. But it is noticeable that in his earlier and most successful campaigns he was a strategist pure and simple. The peace at Klagenfurt is an example. Later on state policy appeared to dominate his strategy. Yorck von Wartenburg points out how gradually his strategy became dominated by the necessity to secure and hold *places* in contradistinction to his former strategy of seeking and defeating the enemy's army in the field. Statescraft was exerting its influence. In 1814 statescraft—or rather his own position in France—demanded war while pure strategy demanded peace. His final downfall can almost be traced directly to his inability to hold the balance level between the two. Napoleon is the one example that the history of recent times affords of the two tasks being united in one man. Even were this solution the best, it is highly improbable that in any great civilised power a condition of affairs will arise that will render possible a dictatorship of this nature.

There is however one exception. In the face of an invasion a military dictatorship might well be adopted by any country as

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a sort of forlorn hope. But imagine, on the other hand, the not impossible case of an army of Great Britain operating in the Low Countries. No situation, either of success or disaster, could well cause the country to accept the control of her destinies by giving autocratic power to a soldier.

A diametrically opposite case of affairs is exemplified in our own country. Whatever benefits we may claim for a system of party government—and they are many—history will not justify a successful military policy being included among them, as far as Great Britain is concerned. It is quite true that the army has eventually proved itself equal to the tasks that the statesman has set it. But it has been by muddling through. In a recent book a case has been made out that any form of representative government is totally at variance with military efficiency. In spite of what I have just said, I think this is going much too far. There is such a thing as the common sense of a nation. But even if it were true, it would be military efficiency and not representative government that would have to disappear. Everything appears to point to all countries adopting this system of government. No one can prophesy what will be the issue of the present convulsions in Russia, but the signs appear to point to democracy. Even in Germany there are not wanting signs that the semi-autocracy that has obtained there is doomed to make way for some form of popular government. Socialism, which is really anti-bureaucracy, has become a vital force, and in spite of the set back at the last elections it will certainly play a prominent part in the future history of the country.

The question then arises, is there no system whereby while the statesman retains his legitimate interference, the evils that have in the past accompanied it can be minimised? Clearly perfect harmony is the first essential. Each should have the advantage of the other's special knowledge. This is recognised in all countries. In Germany a permanent Chancellor and a permanent Chief of the General Staff seem to give us an example of a nearly perfect organisation. In more democratic countries the United States, France and now (at least thanks to Mr. Balfour) in our own, a Defence Committee, with permanent nucleus, co-ordinate the knowledge of the statesman and the soldier and sailor. I think I am right in saying that the original proposal was that the leader of the Opposition should be a member of this Committee. Had this been accepted the Committee would have been nearly a permanent one. Even as it is, it marks a great step in advance from the confusion of interests that formerly existed. It means, I think, that for the first time what is now known as Peace strategy is officially recognised. To understand what this peace strategy which involves the whole question of the relation between the statesman and the politician is, it is necessary again to consider the whole intercourse of nations, and to remember that the struggle for existence is as real in the life of nations as in the animal world. Disraeli once said "A nation cannot stand still, it must either progress or recede," and Bismarck threw some light on the

method of advancing in the epigram. "The only sound principle of action in a state is political egoism not romanticism." In this strife of nations the most certain way of removing a rival is by a successful war. The indemnity, the lowering of prestige, the internal dissensions that often result to the conquered are far more decisive blows than can be delivered by years of peace policy. No state that finds itself in a position to deliver such a blow to its rival will hesitate a moment. It is the task of peace strategy to put this principle into practice both in defence and offence. National defence becomes therefore as much a matter of internal policy as any purely domestic legislation. A country may well decide that circumstances do not demand the increase of her armed forces sufficient to make an aggressive war. The risk, the cost, the loss of productive power, to the State are all factors that must be weighed by the statesman. But every individual in the country is personally concerned with the matter of Home Defence. The choice of war or peace rests with the aggressor. Except in so far as insufficient decisive measures not only invite but by the unalterable laws of the struggle for existence in international life, demands attack. For an offensive war the statesman lays down the object, prepares the ground by alliance and by educating the mind of the nation to the war. The soldier has to prepare the plan of campaign and the weapon; to calculate the chances of success and to afford the statesman the information necessary before he can decide to strike the blow. With such prepared plans and close co-operation the risk of interference is reduced to a minimum for its very *raison d'être* has disappeared. For an instance of this peace strategy at work we turn to Prussia between her two great wars of 1866 and 1870. Bismarck had decided to make Prussia supreme on the continent. Austria was removed as a rival. Russia's ambitions tended towards the East. France alone remained to dispute the claim. The new confederacy of North German States was but recently formed and was only held together by loose bonds.

A national German policy was required to cement these bonds. All these arguments pointed the national policy of Germany to war and the whole system of the state set itself to prepare for the war. Clearly the first task of the statesman must be to isolate France. Lenient terms were offered to Austria, the only proviso being that French mediation would not be tolerated lest by this an *entente cordiale* should spring up between the two countries of France and Austria. Next the French were encouraged to demand territory in Belgium in direct opposition to the lasting policy of England; a draft treaty was even prepared whereby Prussia was to support her in the demand, and the draft was then shown to the English Statesmen to alienate the sympathies of England from France. In Prussia itself public opinion was carefully educated to regarding the war with France as a measure necessary for the very existence of the country. Meantime the army was doing its share of the preparations. Von Roon at the War Office

was expanding the resources and Von Moltke was preparing the plan of campaign and mobilisation measures, and inculcating into the army the lessons of the war of 1866—the proper use of cavalry and the development of artillery. The Intelligence Department kept the information of the resources of France minutely recorded up to every day's changes.

Finally, all was ready to deliver the blow. A trumpety excuse was utilised; the fervour of the people was brought to fever heat by the publication of mutilated telegrams and official correspondence; France was goaded on to declare war, and then the blow was struck.

To sum up the conclusions arrived at: while the statesman has a right to retain his control over the destinies of the country and therefore a prescriptive right to intervene at any stage of the operations, history has shown that such interference often defeats its own ends. The danger of these ill-effects are minimised by close harmony between the two servants of the state.

The successful conduct of a war involves careful political preparation as well as military preparations. The problem of Home Defence should ever be one of the vital points of the policy of the country. The weakening of the power not only invites but renders attack absolutely certain. The necessary preparation for war is as essential for one's potential enemies as for oneself, and as this preparation is both military and political, the soldier as well as the politician must ever be on the lookout for signs.

If any one wishes an object lesson in the preparation of a country for war, Germany again gives one at the present time.

Any one who has studied the politics of Germany during the last few years can see very clearly a connected scheme. Ever since the German Emperor gave voice to the decision of the responsible advisors in the words that the future of Germany lies on the water, there has been a perfectly organised government movement to educate the people to the necessary view. In every station in the country there hangs an illustrated table showing the relative strengths of the English and German fleets, and the signature of the Emperor is attached to lend it weight. Every month witnesses the publication of some new book in popular language on naval tactics, naval construction or history; and, if the Reichstag shows any sign of being unwilling to foot the bill for the increase of the navy, advantage is taken of some little trouble somewhere in the world, where German trade interests clash with those of some other country, to show how her position is weakened by the lack of an efficient navy. The history of the same country gives us an analogy to show us to what this is leading. For fifty years there was the same hum of military preparations, the same keen attention to military matters before Prussia threw herself irresistibly on Austria and France.

There is, I think, one practical lesson to be drawn from this somewhat academic discussion. If you have agreed with me that

in peace strategy, while the question of commencing the preparation for an aggressive war is the task of the statesman assisted by the expert knowledge of his military and naval advisors—for he and he alone has the facts that enable a valuable decision to be made—the question of defence on the other hand is, in a country governed under the representative system, essentially one for every individual in the country. Deep study is necessary before a decision of any value can be obtained, but the study that gives the opinion its value confers also the power of converting other people to the opinion. With the decision formed, comes the task of endeavouring, in season and out of season, to make it the opinion of the country, and to advocate the practical means of remedying the defects. For this practical means still further study will be necessary—the study of politics and political economy. I am well aware of what Ruskin calls “the error of modern times of taking away the best blood and strength of the nation—all that is brave and careless of reward, and scornful of blame, and faithful in trust and casting into steel and making a mere sword of it, taking away its voice and will; but keeping the worst of the nation—whatever is cowardly, avaricious and faithless, and to give to this the voice, to this the authority, to this the chief privilege where there is least capacity of thought.” The servants of the state, whether in the army, navy or the civil services, are most competent of a clear decision and these are prohibited by our constitution from making their opinions heard in public. Still, I think, that if the solid mass of educated army opinion, backed by that knowledge that can come only from study, urged on the nation the remedy of the existing defects, whether that remedy lies in Imperial Federation or National Service, it could not fail to make itself felt. But the first essential is that the means advocated should be practical, that objections raised to it from the standpoint of the civil member of the state should be met from the same standpoint. It serves no useful purpose to say that such and such a means only can meet the case, if the means in question involves disadvantages, other than military ones, of which one has not thought and which one cannot meet by arguments based on a knowledge of facts.

THE APPOINTMENT OF NATIVE OFFICERS IN THE INDIAN ARMY.

By W.

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The writer ventures to put forward some criticism and suggestions in the hope that further consideration of the scheme may be stimulated.

It is claimed in the above article that every one should be able to read and write fluently in *Urdu*. Preliminary objection is taken to the use of the word "*Urdu*." The word has been deleted from App. 5, A.R.I., Vol. 2, "*Hindustani*" being substituted for it. If "*Hindustani*" be substituted for "*Urdu*" the claim is unobjectionable, as any character, such as Urdu, Gurmukhi, or Nagri, will be allowable, but if Urdu be insisted on this will often compel N. C. O.'s hoping for promotion to learn, in middle age, a new character and script, a task sufficient to make the most industrious hesitate.

Under the present Regulations for Native Army Schools, moreover, sepoy's are taught whatever character they are accustomed to : thus Sikh Regiments always use the Gurmukhi character : it has also been the policy of Government for many years to issue Drill-books and other Manuals in Hindustani, but in several different characters.

The characters at present in use, therefore, should remain permissive, Hindustani remaining, nevertheless, the language used. Such a course would not in any way render instruction more difficult and has the advantage of being in accordance with the present policy of Army Headquarters.

Captain Barrett's scheme involves the starting of a college on a large scale, with the concomitant organisation of examining committees, elaborate lists, and registers of candidates.

All this may come in time, but to commence on such broad lines would probably be fatal to the scheme. It is as an introduction to some larger scheme that the writer ventures to put forward a less ambitious proposal which, it is submitted, would stand a better chance of success, and would enable the system to be tested thoroughly before adoption on a larger scale.

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All this may come in time, but it is dangerous to start by an immediate application of the scheme. It is a large and ambitious proposal which, if it is submitted without study and reflection, has the chance of success, and would enable the system to be tested and modified before adoption on a larger scale.

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ranks of a regiment will always be filled up by the promotion of a N.C. O. from one of the other two regiments.

The following advantages are claimed for such a system of promotion in addition to those mentioned by Captain Barrett:—

- (1) The composition of each of the linked regiments being approximately similar, the number of N.C. O.s of each caste to be trained could easily be regulated.
- (2) Linked battalions usually have a good deal in common with each other as regards custom classes enlisted and promoted, and similar internal matters. This would facilitate the acceptance of some such scheme by the Commandants of Native Regiments.
- (3) The list would be a small one: individual cases of hardship would be less likely to occur, and the delicate questions of selection and promotion could be settled more easily between the 3 regiments than if the field of selection were wider.

The education of Native Officers can be treated apart from the question of their selection and promotion.

Admitting that they require more training than they now get, and that this cannot be given regimentally, what are the essentials of any scheme to remedy these defects?

First and foremost is the question of expense.

Until expectations are justified by results, a large expenditure on buildings, travelling expenses and staff would be unwise. This can best be avoided by forming training centres in the principal military stations during the cool weather. The M.W.S. can be relied on to provide temporary quarters, such as obsolete rest camps, etc., for class rooms, and for the loan of furniture*. A grant of Rs. 3 per man would cover contingencies such as stationery and maps. The fact that classes were held at large centres like Peshawar, Nowshera, Rawalpindi, Lahore Cantonments, etc., would obviate the difficulty of large classes, and minimise travelling expenses. Candidates would obtain some stationery compasses, etc., under regimental arrangements and maps of the locality on loan from the local Brigade Major.

The training staff might consist of a carefully selected British Officer with the rank of Captain, assisted if over ten candidates were under instruction by a Subaltern equally carefully selected.

It would be essential to the success of the scheme to give staff pay to these officers.

Two N.C. O.s might be drawn to start with from each regiment in the administrative area. Special classes would be desirable for part of the course at intervals for N.C. O.s from Cavalry Regiments.

Curriculum.—A great divergence of opinion may be expected on the subject of the course of instruction at such classes. It would

* Provided the M.W.S. troops are not used.

have to be carefully laid down by Army Head-quarters, care being taken not to make it too ambitious.

Most Native Officers have already to spend three months at Changla Gali or some other Musketry School, and two months at Transport Training class. It would be idle to conceal the fact that most officers of the Indian Army are opposed to the Musketry Schools: much time is spent in the acquisition of a parrot-like proficiency in the exact words of the manual, and in learning the elements of Musketry. All this can be better instilled regimentally. If one month out of the proposed course of six months were to be devoted to the theory of Musketry, the method of instruction, and the regulations regarding it, most officers would feel that the present course of Musketry might be altogether dispensed with. The saving in this direction would go far to counterbalance the cost of the present scheme.

In the same way, a month devoted to the care and management of transport on the march and in the field would do away with the necessity of sending Native Officers to Transport Training classes. It would not be hard to arrange for a course of, say, 15 lectures by a Transport Officer, combined with a month's practical instruction in transport work, on manœuvres as well as in cantonments.

It should be remembered that in this subject, experience counts for a great deal; packing and loading, for instance, is a subject which ought to be, and is taught under regimental arrangements: and the management of transport in the field is an art which a week's work on manœuvres will do more to instil than a month's lectures.

But unless Musketry and Transport classes are merged into the proposed course of instruction, officers of Native Regiments will object strongly to a system under which courses of instruction would monopolise a whole working year.

Summary —To sum up, I would suggest that classes for the instruction of promising N.-C. O.'s in military subjects be formed in each Brigade under one or two specially selected officers, the course of instruction to last six months and include Transport and Musketry.

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To put the writer's suggestion briefly, it is proposed, firstly, that no man shall be promoted to the rank of Native Officer either by direct commission or through the ranks, until he has passed through a course very similar to the Sandhurst course for British officers; secondly, that at the end of the course the successful candidate shall be appointed as Native Officer in a company of his own class, but in no case in his own regiment.

The two reforms suggested involve radical changes which, if carried out, might produce such startling consequences as had not been contemplated. The majority of British Officers of the Indian Army will at once agree that the proposal in its present shape contains little promise of a successful result, and that an innovation of so drastic a nature would be fraught with the gravest danger to the efficiency of this complicated machine.

While the present proposal, as it stands, will be condemned by practically all officers, it appears to contain the germs of a more moderate reform, which might conduce to greater efficiency in the Native Army. The outlines of such a reform are described later in this article.

Every reasonable man is in favour of a gradual improvement of the standard of education in the army to meet the ever-increasing demands of modern war, provided that the change can be assimilated without prejudice to the harmonious and effective working of the whole. There is no doubt that there is ample scope for improvement in the Native Army of India as well as in many other armies. Let it be noted, however, that the improvement in the fighting efficiency of an army is not by any means in direct proportion to the rise in the standard of education. There are many other factors in the equation, psychological, material, moral, etc., and on some of these factors education does not exercise an uniformly beneficial influence.

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Every reasonable man is in favour of a gradual improvement of the standard of education in the army to meet the ever-increasing demands of modern war, provided that the change can be assimilated without prejudice to the harmonious and effective working of the whole. There is no doubt that there is ample scope for improvement in the Native Army of India as well as in many other armies. Let it be noted, however, that the improvement in the fighting efficiency of an army is not by any means in direct proportion to the rise in the standard of education. There are many other factors in the equation, psychological, material, moral, etc., and on some of these factors education does not exercise an uniformly beneficial influence.

It is highly desirable that, in conjunction with other improvements, the standard of education of Native Officers should be gradually raised. Perhaps in the distant future we can picture an Indian Sandhurst, peopled by the sons of well-educated Indian gentlemen and sending forth a race of Native Officers, loyal to the

State, high in principle, active in body, intelligent of mind and devoted to duty.

When this takes place no half measures will be successful. Promotion through the ranks must be as rare as it is in the British Army. Until, however, a class such as that which produces the majority of British Officers is formed in India, the scheme is impossible. The class is non-existent in India. It is the product of centuries—not decades of wealth and civilisation.

The want "of a well-marked line of social distinction between the Native Officers and the men in the ranks" is undoubtedly a defect of the present system, although, as will be explained later, the present proposal would not remedy this state of affairs.

Before the question of counter-proposals is discussed, it will be advisable to point out some of the reasons why the present proposal does not appear sound, and also to challenge some of the postulates, from which Capt. Barrett has deduced the urgency for reform.

In considering any reform the advantages and disadvantages must be carefully thought out and balanced one against the other. Frequently even when the advantages clearly preponderate, they do not outweigh the disadvantages to such an extent as to compensate for the disturbing—though it may be temporary—influence of any change. Unfortunately in affairs military, as in affairs political, the advantages of a reform are often nearer the surface and consequently more apparent than the disadvantages, while in the old system, which it is proposed to discard, the reverse is the case, the advantages being often concealed while the disadvantages are constantly before our eyes. Frequently the disadvantages of a reform are not apparent, even to the genius of a Talleyrand, until it is launched beyond recall, while the advantages of the old system only come to light when their absence makes itself felt. To revert to the old system is then often impossible.

The advantages of a Sandhurst course for our Native Officers are at once manifest. As a disadvantage, notwithstanding the course of recent events in India, it is not intended to bring forward the baneful effects of the seeds of education planted in an immature soil. The classes, from whom the fighting material is drawn, in company with the better educated gentlemen of India, have amply proved that they are still prepared to co-operate loyally in promoting by peaceful means the welfare of the varied and assorted community that is gathered together under the ægis of the British Empire of India. Higher education can only serve to solidify the well-balanced minds of healthy-bodied men, though it often succeeds in upsetting the equilibrium of clever brains in feebly constituted bodies, more especially when the transition stage from ignorance to education is passed over in one generation.

It is proposed, however, to substitute an entirely new system for the present method of obtaining our Native Officers. The writer of the article appears to have coloured too highly the disadvantages of the present system. He advocates that the present

system leads to "a great deal more *bhaibandi* and patronage than is for the good of the service," and that "the idea gradually creeps into the heads of the men that promotion goes by seniority."

In a regiment where the officers know their men such patronage and such ideas should be impossible. There has probably never been a sounder or better Commanding Officer than the late Sir Harry Lumsden, who raised the Guides. In Appendix A of "Lumsden of the Guides" will be found some valuable notes, which might well form the basis of a portion of the qualifying examination for every Staff Corps candidate in India. In these notes it is clearly laid down that for the efficiency of a regiment promotion must be in the hands of the British Officers alone. The Native Officers must have no powers of exercising patronage in this or in other respects. Sir H. Lumsden also strongly deprecated the idea of allowing promotion to go by seniority alone. Seniority may be one item in a man's claim to promotion, but it should never be allowed to become the chief item. For further enlightenment on this subject a reference is suggested to the Notes themselves which will amply repay the trouble of perusal.

Unfortunately it is not always possible to have a continuity of British Officers. Indeed nowadays it often occurs that there is no British Officer left who really knows the men of the regiment. The result is that for purposes of promotion the Commanding Officer, probably himself quite new to the regiment, is compelled to fall back on his Native Officers for advice. In this case the Native Officers do secure powers of patronage, and it must be admitted that they will generally be influenced in their selection by one of two considerations, either seniority or relationship. This, however, is not the ideal state, for the British Officers should know their men so well that they can make their own promotions. It will be found that, as a rule, a sepoy is quite willing to accept as "*kismet*" the verdict of a British Officer who can have no personal feeling in the matter and knows the regiment, while he will be extremely discontented if he is aware that it is owing to the representations of his Native Officer that he has been passed over for promotion.

A Commanding Officer, who promotes a man to Native Officer (as suggested by Capt. Barrett) when taking everything into consideration he honestly believes that he is not the best man available is lacking in strength of character. For a Commanding Officer to promote a man, merely in order that he may qualify for the pension of a Native Officer, is tantamount to connivance at a swindle of Government. There are occasions, however, when a man is promoted not because he is the best man available, but because his promotion for other reasons—such as influence in recruiting, class, etc.,—is the best in the interests of the Government service. The Commanding Officer can alone be the judge in these matters. Next to recruiting, promotion is the most important item in the interior economy of a regiment. It is certainly the most difficult. It is an art. Good or bad promotions make or mar a regiment. Hence the

State high in principle, active in body, intelligent of mind and devoted to duty.

When this takes place no half measures will be successful. Promotion through the ranks must be as rare as it is in the British Army. Until, however, a class such as that which produces the majority of British Officers is formed in India, the scheme is impossible. The class is non-existent in India. It is the product of centuries—not decades of wealth and civilisation.

The want of a well marked line of social distinction between the Native Officers and the men in the ranks is undoubtedly a defect of the present system, although, as will be explained later, the present proposal would not remedy this state of affairs.

Before the question of counter proposals is discussed, it will be advisable to point out some of the reasons why the present proposal does not appear sound, and also to challenge some of the postulates, from which Capt. Barrett has deduced the urgency for reform.

In considering any reform the advantages and disadvantages must be carefully thought out and balanced one against the other. Frequently even when the advantages clearly preponderate, they do not outweigh the disadvantages to such an extent as to compensate for the disturbing though it may be temporary influence of any change. Unfortunately in affairs military, as in affairs political, the advantages of a reform are often nearer the surface and consequently more apparent than the disadvantages, while in the old system, which it is proposed to discard the reverse is the case, the advantages being often concealed while the disadvantages are constantly before our eyes. Frequently the disadvantages of a reform are not apparent, even to the genius of a Telukind until it is launched beyond recall, while the advantages of the old system only come to light when their absence makes its self felt. To revert to the old system is then often impossible.

The advantages of a Sindhust course for our Native Officers are at once manifest. As a disadvantage notwithstanding the course of recent events in India, it is not intended to bring forward the baneful effects of the seeds of education planted in an immature soil. The classes from whom the fighting material is drawn in conformity with the better educated gentleman of India have amply proved that they are still prepared to co-operate loyally and prominently by peaceful means the welfare of the varied and assorted community that is gathered together under the flag of the British Empire of India. Higher education can only serve to seduce the well favoured minds of highly bred Indian though it often works its misapprehending the equilibrium of our brains and to be a constant and bitter reminder especially when the transition stage from ignorance to education is passed over in one generation.

It is proposed however to substitute an entirely new system for the present method of educating our Native Officers. The writer of the article appears to have considered only the disadvantages of the present system. He also states that the present

system leads to "a great deal more *bhaibandi* and patronage than is for the good of the service," and that "the idea gradually creeps into the heads of the men that promotion goes by seniority."

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necessity that promotion to the Non-Commissioned ranks does not go by the patronage of Native Officers, but by the selection of British Officers, who for this purpose should be thoroughly in touch with and acquainted with their men. This can only be acquired by long service in the regiment.

Once the idea has been allowed to grow in a regiment that promotion goes by patronage of the Native Officers or by seniority, it is with difficulty eradicated. The principle is wrong, and the regiment in which the practice is prevalent will suffer in efficiency. To point out an erroneous application of principle as one of the disadvantages of the present system is, however, a mistake.

Next as to the question of direct commissions. All officers of any length of service in native regiments have seen instances of successful direct commissions and probably several instances where direct commissions have been a failure. When direct commissions were first started, it was perhaps not realised that the supply of first-rate men of the class required would not be equal to the demand. In the classes from which the fighting material is drawn, there is not so far a sufficiency of wealthy families to furnish well educated, well bred young men to fill the gaps in the commissioned ranks. Owing to caste and other prejudices, which are too deep-seated to be uprooted in our time, the Native Officer must, as a rule, be drawn from the same class and from the same part of the country as the men of his class company. Sepoys are quite prepared to obey imported Native Officers provided they are of good family and known to them at their homes, but they are not prepared to recognise the authority of men of other classes or of inferior caste.

The giving of direct commissions is always like a venture in the dark. The best judge for the probable success of such a venture is the Commanding Officer. He has to take into consideration many factors. Sometimes with the best of intentions he finds that he has made an error. In the first place much depends on the character of the man to whom the commission is given. This can only be judged after the youth has served for some time in the regiment. In the second place a great deal depends on the influence which his family and caste will secure for the candidate in his new position. This can be ascertained by careful enquiry before enlistment. In the third place attention must be paid to the merit and influence of rival claimants for the position of Native Officer who may happen to be serving in the regiment at the time, and must therefore be superseded. In the fourth place a great deal depends on the Commanding Officer and his power over his regiment. There are also other considerations which need not be detailed, as sufficient have been enumerated to explain the difficulty of a decision and to point out that granting of commissions to young men in a regiment would create endless trouble.

As the system of direct commissions goes at present, it has mainly resulted in the granting of commissions to the sons of retired Native Officers. Other suitable men have not been forth-

coming in sufficient numbers to fill the gaps. Under the new system direct commissions would probably fall, as hitherto, from mere dearth of suitable or desirable candidates to the sons of Native Officers. No passing through any course will in any way improve their social status in the eyes of the men.

Similarly in the case of promotion through the ranks it is not evident how the creation of the "Native Officer caste" will be facilitated by the transfer of successful candidates to companies of their own class in different regiments. If the new Native Officers belong, as they must do, and it is suggested that they should do, to the same class and district as the men in their new companies, their antecedents will be known at once and they will be appraised at their true value in the social scale immediately they are posted to the new regiment. They will quickly surround themselves with a *clientèle* of their own friends and relations by enlistment, and "the well-marked line of social distinction" will be as lacking as ever while no fresh barrier will be erected against patronage and *bhai-bandi*.

In the case of regiments recruited from frontier tribes, "where the men are to a great extent illiterate," the writer hints only at the difficulty of obtaining suitable men for commissions. He does not suggest a solution. The difficulty would be a real one, for in the case of democratic tribes, like those along the frontier, no men have social status or authority on account of their birth. This class, more than any other, would resent the importation of men of other classes to command their companies.

There is one other point which must be taken into consideration in giving direct commissions. There is no doubt that the quality of recruits is affected by any change in their prospects. Just as every cadet at Sandhurst pictures himself with a Field-Marshal's bâton in his pocket, so every native recruit on joining allows his imagination to soar to the "*dignitas cum otio*" of the retired Native Officer. Not every cadet becomes a Field-Marshal, but the hope spurs him on, until, when the fires of youth die down, he recognises that the bâton is not for him, and becomes reconciled to the prospect of a humbler lot. Similarly the native recruit cherishes a secret hope in his youth that he may one day become a Native Officer, but ends in being content with a lot less exalted than that of his initial aspirations.

If you make the bâton the prerogative of princes of the blood royal, or the rank of Native Officers the right of a special class, you must inevitably lower, to a greater or less extent, the class of man who is prepared to struggle through the grades of British Officers or through the native ranks.

It is, therefore, clear that the institution of a college for Native Officers and the transfer of successful candidates to other regiments can neither produce "a well-marked line of social distinction" between the officers and men of the ranks, nor will it assist in abolishing patronage and *bhai-bandi*. The proposal, if carried out, would

have a prejudicial effect on recruiting and the efficiency of the Native Army. Direct commissions cannot be given with too lavish a hand, until a class, at present practically non-existent in India, has developed sufficiently to fill the commissioned ranks. The mixture of direct commissions and promotions through the ranks can never produce a "caste" of Native Officers.

With a view to the gradual improvement of the standard of education of the Native Officer, the suggestion that a college of instruction should be started seems eminently sound, if financial considerations permit.

This college should be established at some centre, where Non-Commissioned Officers of the rank of Duffeldars and Havildars who appear to have the makings of a Native Officer should be sent to gain a certificate. The acquisition of this certificate should not be a *sine qua non* for the rank of Native Officer, but should bear the same relation to promotion as, in the case of British Officer, a *p. s. c.* does to employment on the staff.

Similarly probationers for direct commissions should be sent at the end of the period of probation in their regiments to this college, in order to obtain the qualifying certificate. Direct commissions might be given exactly as at present, but the period of probation would be extended to enable the candidate to obtain his proficiency certificate at the school.

On completing the course students should revert to their regiment in the same grade. As it has been demonstrated above, that no accession of "caste sentiment" can be gained by transferring men to other regiments, it is argued that in the majority of cases it is far better to send men back to their own regiments. Transfers can still be effected, as is often done now, when thought desirable, but it would be prejudicial to the interests of the service to make such transfers the rule instead of the exception.

With regard to the syllabus of subjects laid down in Capt. Barnett's article the wisdom of compelling all Native Officers to read and write fluently in Urdu appears questionable. This is demanding from them a standard to which few British Officers attain. How many British Officers can do more than read and write fluently in their own language? It is quite evident that it would simplify matters enormously if there was a *lingua franca* for the medium of conversation and correspondence in the Native Army instead of the polyglot system now in vogue but is the suggestion practical? To expect it is surely taxing the intellect of poorly educated men too high. The rest of the subjects, excluding law, might well form the curriculum of the course.

If we really desire however to improve the standard of education of the army and wish that that of the Native Officers we must go further back still. Schools and schools, when pressed to pass educational examinations, frequently complain that there are no schools near their homes so that Government do not give them a fair chance. It is no good to suppose that a well educated man

can be produced out of raw material after the age for entry into the ranks has been passed. After enlistment a little can be done in improving the material but, if during the receptive period of youth the fields of the brain have been allowed to lie fallow, satisfactory results after maturity can never be expected. One might just as well expect to make a first-class musician, cricketer or racquet player out of a man after he is full grown, without having had any previous experience in those lines. It is true that a few brilliant exceptions do occur, but they are rare. In learning, as in everything else, the process of education must be commenced early.

The education of the army rests not so much in the hands of the military authorities as in the hands of the nation. It is the same in England, it is the same everywhere. To obtain a high-class, well-educated fighting man in the ranks the standard of education of the whole population must be raised by means of improved State-aided schools. Germany has the best State schools and the best educated army.

The present suggestions for the improvement of the standard of Native Officers are :—

- (i) Greater facilities for the education of the fighting classes in their villages.
- (ii) A college of instruction for selected N.-C. O.'s and direct commissions.

NATIVE OFFICERS OF THE INDIAN ARMY.

BY MAJOR A. M. S. ELSMIE, 56TH PUNJABI RIFLES, F.F.

"Festina lente." "In medio tutissimus ibis."

The article by Captain A. L. Barrett, I.A., in the April 1907 number of the U.S.I. Journal on the appointment of Native Officers in the Indian Army deals with a subject of such importance that a false move in the matter might easily tend to ruin the Native Army.

To put the writer's suggestion briefly, it is proposed, firstly, that no man shall be promoted to the rank of Native Officer either by direct commission or through the ranks, until he has passed through a course very similar to the Sandhurst course for British officers; secondly, that at the end of the course the successful candidate shall be appointed as Native Officer in a company of his own class, but in no case in his own regiment.

The two reforms suggested involve radical changes which, if carried out, might produce such startling consequences as had not been contemplated. The majority of British Officers of the Indian Army will at once agree that the proposal in its present shape contains little promise of a successful result, and that an innovation of so drastic a nature would be fraught with the gravest danger to the efficiency of this complicated machine.

While the present proposal, as it stands, will be condemned by practically all officers, it appears to contain the germs of a more moderate reform, which might conduce to greater efficiency in the Native Army. The outlines of such a reform are described later in this article.

Every reasonable man is in favour of a gradual improvement of the standard of education in the army to meet the ever-increasing demands of modern war, provided that the change can be assimilated without prejudice to the harmonious and effective working of the whole. There is no doubt that there is ample scope for improvement in the Native Army of India as well as in many other armies. Let it be noted, however, that the improvement in the fighting efficiency of an army is not by any means in direct proportion to the rise in the standard of education. There are many other factors in the equation, psychological, material, moral, etc., and on some of these factors education does not exercise an uniformly beneficial influence.

It is highly desirable that, in conjunction with other improvements, the standard of education of Native Officers should be gradually raised. Perhaps in the distant future we can picture an Indian Sandhurst, peopled by the sons of well-educated Indian gentlemen and sending forth a race of Native Officers, loyal to the

State, high in principle, active in body, intelligent of mind and devoted to duty.

When this takes place no half measures will be successful. Promotion through the ranks must be as rare as it is in the British Army. Until, however, a class such as that which produces the majority of British Officers is formed in India the scheme is impossible. The class is non-existent in India. It is the product of centuries—not decades of wealth and civilisation.

The want "of a well-marked line of social distinction between the Native Officers and the men in the ranks" is undoubtedly a defect of the present system, although, as will be explained later, the present proposal would not remedy this state of affairs.

Before the question of counter-proposals is discussed, it will be advisable to point out some of the reasons why the present proposal does not appear sound, and also to challenge some of the postulates, from which Capt. Barrett has deduced the urgency for reform.

In considering any reform the advantages and disadvantages must be carefully thought out and balanced one against the other. Frequently even when the advantages clearly preponderate, they do not outweigh the disadvantages to such an extent as to compensate for the disturbing though it may be temporary influence of any change. Unfortunately in affairs military, as in affairs political, the advantages of a reform are often nearer the surface and consequently more apparent than the disadvantages, while in the old system, which it is proposed to discard, the reverse is the case, the advantages being often concealed while the disadvantages are constantly before our eyes. Frequently the disadvantages of a reform are not apparent, even to the genius of a Tolstoid, until it is leaped beyond recall, while the advantages of the old system only come to light when their absence makes its self felt. To revert to the old system is then often impossible.

The advantages of a South-East course for our Native Officers are at once manifest. As a disadvantage, notwithstanding the course of recent events in India, it is not intended to bring forward the baneful effects of the seeds of education planted in an immature soil. The classes from whom the fighting material is drawn in company with the better educated gentlemen of India have amply proved that they are still prepared to co-operate loyally in promoting by peaceful means the welfare of the varied and assorted community that is gathered together under the wings of the British Empire of India. Higher education can only serve to so far as the well bred minds of healthy bodies, but, though it often succeeds in marring the complexion of the body, it does not destroy the constitution of the body, especially when the first stages of a general education has been passed over in one generation.

It is proposed, however, to substitute an entirely new system for the present method of obtaining our Native Officers. The writer of the article appears to have considered too largely the disadvantages of the present system. He overlooks that the present

system leads to "a great deal more *bhaibandi* and patronage than is for the good of the service," and that "the idea gradually creeps into the heads of the men that promotion goes by seniority."

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Next as to the question of direct commissions. All officers of any length of service in native regiments have seen instances of successful direct commissions and probably several instances where direct commissions have been a failure. When direct commissions were first started, it was perhaps not realised that the supply of first-rate men of the class required would not be equal to the demand. In the classes from which the fighting material is drawn, there is not so far a sufficiency of wealthy families to furnish well educated, well bred young men to fill the gaps in the commissioned ranks. Owing to caste and other prejudices, which are too deep-seated to be uprooted in our time, the Native Officer must, as a rule, be drawn from the same class and from the same part of the country as the men of his class-company. Sepoys are quite prepared to obey imported Native Officers provided they are of good family and known to them at their homes, but they are not prepared to recognise the authority of men of other classes or of inferior caste.

The giving of direct commissions is always like a venture in the dark. The best judge for the probable success of such a venture is the Commanding Officer. He has to take into consideration many factors. Sometimes with the best of intentions he finds that he has made an error. In the first place much depends on the character of the man to whom the commission is given. This can only be judged after the youth has served for some time in the regiment. In the second place a great deal depends on the influence which his family and caste will secure for the candidate in his new position. This can be ascertained by careful enquiry before enlistment. In the third place attention must be paid to the merit and influence of rival claimants for the position of Native Officer who may happen to be serving in the regiment at the time and must therefore be superseded. In the fourth place a great deal depends on the Commanding Officer and his power over his regiment. There are also other considerations, which need not be detailed, as sufficient have been enumerated to explain the difficulty of a decision and to point out that granting of commissions haphazard in a regiment would create endless trouble.

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coming in sufficient numbers to fill the gaps. Under the new system direct commissions would probably fall, as hitherto, from mere dearth of suitable or desirable candidates to the sons of Native Officers. No passing through any course will in any way improve their social status in the eyes of the men.

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It is, therefore, clear that the institution of a college for Native Officers and the transfer of successful candidates to other regiments can neither produce "a well-marked line of social distinction" between the officers and men of the ranks, nor will it assist in abolishing patronage and *bhai-bandi*. The proposal, if carried out, would

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With a view to the gradual improvement of the standard of education of the Native Officer, the suggestion that a college of instruction should be started seems eminently sound, if financial considerations permit.

This college should be established at some centre, where Non-Commissioned Officers of the rank of Duffedars and Havildars who appear to have the makings of a Native Officer should be sent to gain a certificate. The acquisition of this certificate should not be a *sine quâ non* for the rank of Native Officer, but should bear the same relation to promotion as, in the case of British Officer, a *p. s. c.* does to employment on the staff.

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If we really desire, however, to improve the standard of education of the army, and with it that of the Native Officers, we must go further back still. Sowars and sepoys, when pressed to pass educational examinations, frequently complain that there are no schools near their homes so that Government do not give them a fair chance. It is no good to suppose that a well-educated man

can be produced out of raw material after the age for entry into the ranks has been passed. After enlistment a little can be done in improving the material but, if during the receptive period of youth the fields of the brain have been allowed to lie fallow, satisfactory results after maturity can never be expected. One might just as well expect to make a first-class musician, cricketer or racquet player out of a man after he is full grown, without having had any previous experience in those lines. It is true that a few brilliant exceptions do occur, but they are rare. In learning, as in everything else, the process of education must be commenced early.

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- (ii) A college of instruction for selected N.-C. O.'s and direct commissions.

THE AUSTRALIAN COMMONWEALTH MILITARY FORCES.

**A Lecture delivered at the India Staff College, Quetta,
on the 24th June 1907.**

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Introductory Remarks.

Prior to the inauguration of the Australian Commonwealth, each of the six Australian Colonies maintained its own small Military Force. Each had its own Commandant, Permanent Staff, Permanent Troops, and Militia and Volunteer Forces. Each Force was quite distinct from any other Force and there was a wide diversity of uniform, conditions of service, system of training and of the Acts and Regulations under which each Force was established and regulated. To weld these inharmonious atoms into a harmonious whole was the formidable task which confronted the newly-formed Australian Defence Department, when the Commonwealth sprang into being on the 1st January 1901. One of the principal reasons that induced the Australian Colonies to federate was the paramount necessity of united action in the matter of Defence, and little time was lost in organising the new Federal Forces. That this was accomplished so quickly and with so little friction speaks volumes for the energy and ability of Major-General Sir Edward Hutton, K.C.M.G., C.B. (who was brought out from England to organise and command the new Forces), his Staff, and for the patriotism and self-negation of all ranks comprising the various disjointed Forces of the six Colonies. The establishment of a regular standing Army does not find favour in Australia because such is thought not to be suitable to the particular needs of Australian Defence, because it is opposed to Australian political thought, and finally for the always potent reason of economy. The basis of Australian Military organisation therefore is a citizen Army, though there is a small Regular or Permanent Force as will be related later on.

The Australian Defence Force is thus divided, in the words of the Defence Act, "into two branches called the Permanent Forces and the Citizen Forces." The composition and duties of the Forces will be indicated in detail later on.

In time of war, the whole of the male population, with some unimportant exceptions, is liable to be called out for service by proclamation. For this purpose the male population is divided into four classes. Class I would be called upon in the first instance and when exhausted the following classes would be exhausted in rotation:—

The classes are as follows, viz.:—

Class I.—All men of the age of 18 years and upwards, but under 30 years, who are unmarried, or widowers without children.

Class II.—All men of the age of 30 years but under 45 years, who are unmarried or widowers without children.

Class III.—All men of the age of 18 years and upwards, but under 45 years, who are married or widowers without children.

Class IV.—All men of the age of 45 and upwards, but under 60 years.

There is a strong and growing school of political thought in Australia that favours compulsory military service somewhat on the Swiss system modified and its exponents are not confined to any political party.

The Prime Minister of Australia, the Hon'ble Alfred Deakin, in a speech delivered in London about three weeks ago, said that Australia soon hoped to reach the ideal, that with universal citizenship there should also be universal service.

One hopeful factor that makes for the success of the Australian Military Forces is the intense and patriotic interest which is taken by all shades of political opinion in matters of Defence, which has happily not been made a party question.

Members of all ranks of the Military Forces are not required, unless they voluntarily agree, to serve beyond the limits of the Commonwealth, or those of any territory under the authority of the Commonwealth.

In times of peace the Military Forces are subject to the Defence Acts of 1903-04 and the Regulations made thereunder, but while on active service become subject to the Army Act, except as regards certain provisions which the Regulations may lay down as not applicable to the Australian Forces.

The approximate numbers of the Australian Troops are as follows:—

Field Force.—Peace establishment, 13,822 with 60 guns.

Garrison Troops.—11,753. The peace and war establishment is the same for Garrison Troops.

There are also about 30,000 members of rifle clubs. These have a semi-military organisation and are attested for service. They form a reserve force. The total peace establishment thus is about 25,575 without rifle clubs or 55,575 with rifle clubs. In war the establishment of the Field Force increases to 27,769 with 76 guns, making the number of troops available for war 39,522 with 76 guns, or if rifle clubs are counted 69,522 and 76 guns. There is little doubt that these numbers could be very much expanded. Australia sent 848 officers and 15,237 others to South Africa without dislocating existing units.

It is now proposed to discuss the various branches of the service referred to above in detail.

The Permanent Forces of the Commonwealth consist of:—

- (1) The Administrative and Instructional Staff.
- (2) The Royal Australian Artillery, numbering about 700 officers and men.
- (3) The Engineers, Submarine Mining Section, about 100.
- (4) The Army Service Corps, small unit.
- (5) The Army Medical Corps, small unit.
- (6) The Ordnance Corps.

All the above units are at all times liable to be employed on active service and in the defence and protection of the Commonwealth and the several States.

Commissions.—These are obtained as follows:—

1. Notice of vacancies is given by advertisement in all States and in Military Orders and applications received by District Commandants who forward same to Military Board stating their opinion of the fitness of each candidate for appointment.

Candidates are subsequently notified of their nomination to undergo the literary examination prescribed.

The following persons are eligible for appointment provided they are passed as fit by a Medical Board, and subject to passing the prescribed examination:—

For Royal Australian Artillery and Engineers—

- (a) Officers of Militia and Volunteer Forces between the ages of 19 and 25 years at date of holding examination.
- (b) Warrant Officers, Non-Commissioned Officers and men who have served for three years in the Defence Forces and are between the ages of 19 and 25 years as in (a).
- (c) Other candidates subject to conditions in (a).

The above conditions apply also to candidates for Administrative and Instructional Staff except that for (a) and (b) the age limit is 22 to 35 and for (c) 22 to 30.

For the Engineers a candidate must in addition have served as a pupil for three years in Engineering workshops or as a Cadet in Civil Engineering or Architecture, as an undergraduate in an Engineering Department of a University or permanently in connection with Military Engineering.

The educational examination for Royal Australian Artillery and the military examination for Administrative and Instructional Staff, if there are more candidates than vacancies, which is generally the case, is competitive.

First appointment is to rank of Lieutenant.

Names of candidates for the Administrative and Instructional Staffs will, after they have passed the educational qualifying examination, be published in Military Orders as eligible for examination in the military competitive examination and those successful are appointed for six months on probation. At the end of that period the appointment may be confirmed on the report of the District Commandant, under whom the candidate served, that he has satisfactorily performed his duties and is likely to become a suitable Staff Officer. Successful

candidates for the Royal Australian Artillery and Engineers are appointed for six months on probation and must, during the six months, pass a qualifying examination in military subjects. The appointment of any candidate who fails to pass will not be confirmed. The subject and scope of the literary and military examinations are as set out from time to time in Standing or other Orders.

Before going on to the subject of pay it is to be noted that the officers of the Permanent Administrative and Instructional Staff of Australia are members of a Staff Corps in itself, the Commanding Officer being the Deputy Adjutant-General. Appointments are made direct to the Corps and seniority recorded according to date of commission.

Pay.

The pay of all officers is consolidated and is as follows:—

Administrative and Instructional Staff.

Lieutenant—£250 to £350 per annum. Four biennial increments of £25 per annum.

- (1) After 2 years' service subject to favourable report.
- (2) After 4 years' service subject to passing for rank of Captain and favourable report.
- (3) After 6 years' service as in (1).
- (4) After 8 years' service as in (1), but highly so.

Captains—£375 to £450. Three annual increments of £25 per annum, provided however that the second increment is not admissible until after having qualified for promotion to the next higher rank.

Majors—£475 to £550. Conditions as with Captains.

Lieutenant-Colonels—£550 to £650.

Pay of Inspector-General varies somewhat. Pay of Military Board may be reckoned as between £650 to £800 per annum.

Pay of District Commandant is graded according to the size and importance of the several States in the Commonwealth, viz., from about £700 to £1,000 per annum.

Warrant Officers and Non-Commissioned Officers of the Administrative and Instructional Staffs.

On appointment.	Annual rate.
Class IV (Sergeant) ...	... £136 to £146.
On promotion to	
S. S. Instructor, Class III	... £155 to £164
S. S. M. Instructor, Class II	.. £173 to £182.
S. W. O. „ „ I	... £191 to £210.
G. S. M. ...	... £228 to £246,

The establishment of the several classes is laid down by Military Board.

After two years' service in the minimum rate the increment to maximum rate of each rate may be approved on recommendation of the District Commandant.

Warrant and Non-Commissioned Officers required to provide a horse draw forage allowance at the rate of £30 per annum and on first appointment receive an allowance not exceeding £10 in lieu of uniform.

Officers, Royal Australian Artillery and Engineers.

Lieutenants—£200 to £300.	| Majors—£425 to £500.
Captains—£325 to £400.	| Lieutenant-Colonels—£500 to £600.

The increments are subject to similar conditions as laid down for Staff.

Warrant Officers, Non-Commissioned Officers and men.

Daily rates from 13s. per diem for a 1st Class Master Gunner to 5s. per day for a Battery or Company Sergeant.

Corporals—4s. Bombardiers—3s. 6d. Drivers and Gunners—2s. 6d.

Good Conduct Pay.

After 2 years 2d. per diem.

After 4 years 4d. per diem.

After 6 years 6d. per diem.

All subject to the usual service conditions.

Specialist and special duty pay are allowed to District Gunners, Gun Layers, Ranger takers, Signallers, Clerks, etc., from 6d. to 3d. per day and tropical pay in addition to ordinary pay to the Permanent Garrison at Thursday Island and Townsville.

The pay of Officers of Australian Engineers is the same as the Royal Australian Artillery, that of the Warrant Officers, Non-Commissioned Officers and Sappers ranges from 13s. to 4s. 3d. per day according to rank.

Good Conduct Pay, same as Royal Australian Artillery.

Army Staff Corps from 13s. to 3s. 3d. according to rank and Good Conduct Pay in addition.

Army Medical Corps from 13s. to 2s. 6d.

The subjects and scope of the examinations for promotion are set out in Standing Orders, and are much the same as laid down for the Imperial Service excepting that Commonwealth Regulations take the place of the King's.

Ordnance Corps.—Pay is consolidated. Armourers from £160 to £240 per annum according to grade.

Storeman from £126 to £200.

Carpenters, Saddlers, Sailmakers, Blacksmiths, Labourers, etc. from £120 to £156.

Armament Artificers from 13s. to 11s. per day.

Assistant Artificers from 6s. to 8s. per day.

Military Staff Clerks are classified for rank and precedence as Warrant Officers and Non-Commissioned Officers and the establishment of the various classes will be in accordance with provisions made from year to year in the estimate. Promotion to higher classes is subject to the approval of the Military Board on recommendation of the District Commandant.

Rates of pay range from £335 per annum, First Class Clerk to £160 and Fourth Class Clerk £285 (maximum pay) to £70 (minimum).

The standard age, height and chest measurement for recruits for all branches of the Permanent Forces is:—

Age limit, 18 years to 30 years.

Height (minimum), 5' 7".

Chest measurement (minimum), 35 inches.

Men approved for enlistment are engaged for five years and may re-enlist for a period of three years provided they are medically fit and approved by Commanding Officer.

Age for Retirement.

Officers and soldiers are retired at the ages set forth, but in special cases the Governor-General may extend the prescribed age for retirement for a period not exceeding two years:—

Major-General, 62. Colonel, 62. Lieutenant-Colonel, 60. Major, 55. Captain, 53. Lieutenant, 48. Quarter-Master, 60. Warrant Officers and Military Staff Clerks, 60. Non-Commissioned Officers and men, 50.

There is no pension.

Pay Department.

This is entirely civilian. In each State the Department is under the superintendence of a District Paymaster who is responsible for the disbursement of public monies in accordance with the regulations.

He acts as financial adviser to the District Commandant upon all questions involving expenditure and keeps him informed of all expenditure on votes so as to avoid any vote being exceeded.

Militia.

The Militia Forces consist of troops who are not bound to continuous service and who are paid for their services so prescribed.

Enlistment.—Standard age, 18 to 35. Height, 5' 6". Drivers 5' 4". Gunners 5' 7". Chest measurement, 34". Drivers 33" Gunners 35" and terms of service years.

Militia Pay.

Subject to provision being made by Parliament, pay for the parades attended in accordance with the regulations for efficiency is granted to officers and soldiers serving in the Militia as follows:—

<i>Rate per diem.</i>			
£. s. d.			
Colonel ...	...	2	5 0
Lieutenant-Colonel ...	...	1	17 6
Major ...	...	1	10 0
Captain ...	...	1	2 6
Lieutenant ...	...	0	15 0
Regimental Sergeant-Major down to Private.	$\left\{ \begin{array}{l} 0 \ 12 \ 0 \\ \text{to} \\ 0 \ 8 \ 0 \end{array} \right\} \text{according to rank.}$		
Trumpeter ...	...	0	4 0
Extra pay to Light Horse for provision of horse, from	...	5	12 6
for Colonel to ...	...	1	0 0
for private, per annum.			

Rates for Militia Engineers are rather higher ranging from £1-13-9 per day for Major to 17s. per day for Lieutenant, and from 12s. 6d. per day for Sergeant-Major to 8s. for Sapper.

The maximum number of days laid down per annum is:—

Light Horse, Field and Garrison Artillery	}	16
Infantry and Departmental Corps		
Engineers, Submarine Mining Companies ...		25
Engineers, Field and Electrical ...		2

Volunteer Forces.

The Volunteer Forces consist of troops who are not bound to continuous military service and who are not ordinarily paid for their services in time of peace. Enlistment—standard age, 18 to 45 years, height 5' 4" and chest measurement 33", and term of service not less than two years or more than three.

Cadets.

The formation and training of Cadet Corps is considered of much importance in Australia, and the fostering of the movement by every means possible by the military authorities is one of its important functions. The reason for this is that it is thought that much of the success of the Force, constituted as it is, depends upon inculcating into the minds of the youth of the Commonwealth at a receptive age, the duty they owe their country in the matter of its defence, to develop their love for rifle shooting, and to instil into them habits of physical and mental discipline inseparable from military training of even a rudimentary character. It is hoped that a large proportion of the Cadets will eventually enlist into

the Force proper on attaining manhood, and in any case, those who do not, will at least be in a more efficient state to respond to the call of arms should it be necessary for the Commonwealth to make a supreme effort in its own defence, or in that of the Empire.

The Education Department is not a Commonwealth one, and each State separately controls its own. Happily, however, there has been no friction in the matter and the various State Governments in general and their Educational Departments in particular have responded with much enthusiasm to the appeals of the Commonwealth, with a result that Cadet training is practically compulsory in each State school in Australia. It is only possible to touch briefly and generally upon the organisation of the movement. The Head of the Cadet administration is the Director of Army Medical Corps and Cadets at Headquarters, Melbourne.

There is a Volunteer Officer Commanding Cadet Corps in each State. The Cadets in each State are organised into 8 Company Battalions and officered by Volunteer Officers who must be teachers employed by the Education Department. There are permanent Officers of the Instructional Staff, and permanent Warrant and Non-Commissioned Officers of the Instructional Staff specially allotted to the Cadets for their training and to assist in their administration generally.

The Commonwealth also provides arms, ammunition and equipment, and gives a small annual capitation grant towards the upkeep of the Corps.

It may be said further that the Cadet Corps are sub-divided into senior and junior Cadet Battalions, the latter being established for bigger boys, too old for junior Cadets and too young for the Military Corps proper of the Commonwealth.

The movement, at present of considerable extent, is to be materially extended at an early date.

Rifle Clubs.

A large number exist all over Australia, the total number of members severally enrolled being roughly 30,000.

These form part of the military system of the Commonwealth and are practically the nucleus of a reserve: all active members on joining undertaking to serve as members of the Reserve Forces in time of any emergency.

The clubs are under the supervision of the District Commandant who has on or attached to his Staff an officer to deal with all the correspondence and returns, etc.

Rifles are issued on application from Captains of clubs on prepayment at the prices given in the Ordnance Store Price List and free ammunition is issued as follows:—

For each member—

For efficiency	...	...	150 rounds.
„ musketry	...	...	50 „

In addition each active member is credited with 100 rounds of free ammunition on first enrolment to enable him to acquire proficiency in learning to shoot.

To be efficient every active member must have fired a course of musketry as laid down in Standing Orders and have kept his arms and accoutrements in good order.

Rifle Associations.

There is a Commonwealth Rifle Association Council whose objects are the promotion and conduct of all International and Inter-State Rifle Competitions and the decision of any questions in connection with rifle shooting that may be referred to it by any Rifle Association.

In each State there is a State Rifle Association governed by a Council of which the District Commandant is President (*ex-officio*).

This Council is charged with the conduct of all rifle matches and the promotion of rifle shooting generally.

Several important Rifle Meetings are held at intervals every year at which shooting is of a very high class and competition extremely keen.

Organisation of the Forces.

Prior to 1905.—From the inauguration of the Commonwealth until the beginning of 1905, the central organisation of the Forces was on the lines of a General Officer Commanding the Forces, assisted by a Headquarter Staff. Upon the departure, however, of Major-General Sir Edward Hutton at the latter part of 1904, the organisation now to be described was brought into force, *viz.* :—

Council of Defence.—At the Head of the Defence Department is the Hon'ble the Minister of State for Defence. There is a Council of Defence, which however as it deals with both Military and Naval Defence, does not consist entirely of Military Members.

It consists of the following Regular Members :—

The Minister of Defence, President.

The Treasurer, who is a Cabinet Minister.

The Inspector-General, Military Forces.

The Director, Naval Forces.

The Chief of Intelligence who is a Military Member.

There are, in addition, Consultative Members consisting of such officers of the Citizen Forces and expert advisers as the President may from time to time summon to the meeting.

The functions of the Council are to inquire into, discuss and record opinions upon matters submitted to them by the Ministers affecting :—

- (a) The general policy of the Military and Naval Defence of the Commonwealth and of the several States.
- (b) Measures necessary for the Defence of the Commonwealth in time of war.
- (c) The total expenditure upon Defence and its distribution.

The Council only meets upon such occasions as the Minister may think fit to summon it.

Military Board of Administration.—The Military Board, subject to the control of the Minister, is charged with the administration of all matters relating to the Military Forces.

Members of the Board and officers appointed in connection therewith severally exercise such powers and perform such duties as are from time to time assigned to them by the Minister.

The Board consists of Regular and Consultative Members.

The Regular Members are :—

The Minister of Defence, President.

The Deputy Adjutant-General.

Chief of Intelligence.

The Chief of Ordnance.

and

The Finance Member, who is a civilian.

The Consultative Members are such officers of the Citizen Forces as the President may summon to a meeting of the Board.

The following are the appointments of Directors and Sub-Heads of Departments in connection with the Military Board, *viz.* :—

(a) Director of Engineer Services.

(b) Director of Stores.

(c) Director of Army Medical Corps and Cadets.

There is also a Promotion Board to consider the promotion of all officers to ranks higher than Captain. The Inspector-General is President.

Inspector-General.

The Inspector-General of the Military Forces by virtue of his office takes rank and precedence as senior officer of the Military Forces of the Commonwealth.

The following are his duties :—

He inspects the Military Forces of the Commonwealth, and the Military Forts and Defence Works and buildings. He reports upon the results of the administration of the Forces, the efficiency of the troops, the system of training, the equipment, the preparedness of the Forces for war, and the state and condition of all defence works, buildings and stores.

He furnishes an Annual Report to the Military Board on the 1st January, and intermediate reports whenever he thinks fit, or is so requested by a Member of the Board.

The 1st Inspector-General was Major-General H. Finn, late 21st Lancers. The present Inspector-General is Major-General J. C. Hoad, C.M.G., the first Australian Officer to hold the appointment. It may be here noted that no officers of the British Army are now employed in connection with the Australian Military Forces. All Staff appointments and District Commands are held by officers of the Australian Permanent Staff.

District Staff.

The Commonwealth is divided into six Military Districts, corresponding to the several States of—

- (a) New South Wales.
- (b) Victoria.
- (c) Queensland.
- (d) South Australia.
- (e) Western Australia.
- (f) Tasmania.

Each of these districts is commanded by an officer of the Australian Permanent Staff termed a District Commandant, who is of the rank of either Brigadier-General, Colonel or Lieutenant-Colonel, according to the importance of the Command and his seniority.

Each Commandant is assisted by the following District Staff of Officers of the Australian Permanent Staff, *viz.* :—

- (a) Assistant Adjutant-General and Chief Supply Officer.
- (b) Deputy Assistant Adjutant-General.
- (c) Deputy Assistant Quartermaster-General.
- (d) Staff Officer for Artillery (who is the Officer Commanding the Royal Australian Artillery in the State).
- (e) Staff Officer, Engineer Services (who is the Officer Commanding the Permanent Section, Corps of Australian Engineers in the State).
- (f) Principal Medical Officer.
- (g) Principal Veterinary Officer.

Both the latter are Militia Officers.

The above applies to the larger districts. In the smaller ones it is modified by one officer sometimes performing the duties of two or more of the above appointments.

Instructional Staff.

In addition to the district Staffs enumerated above, there are allotted to each district certain officers of the Australian Permanent Staff termed Instructional Staff Officers. These are allotted, roughly speaking, about one each to about every two Militia Regiments of Light Horse and Infantry. They are attached to Corps for imparting instruction in drill, tactics, discipline, organisation and administration. They are under the command of the Militia Brigadiers to whose Brigade they are attached. They assist the Brigadiers and Commanding Officers in their administrative duties in connection with their commands.

They are instructors in the broadest sense of the term, and it is their special duties to instruct and assist the Militia and Volunteer Brigade-Majors and Adjutants of Regiments in their administrative, clerical, and other duties.

It is to the Instructional Staff that officers are posted on first appointment to the Australian Permanent Staff.

To each Corps of the Militia and Volunteers there are also allotted a proportion of Warrant or Non-Commissioned Officers of the Permanent Staff as Instructors.

Organisation of the Troops.

The Field Force is for the defence of the Commonwealth generally, and may be employed in the defence of the district to which it belongs or may be concentrated in any part of the Commonwealth as the exigencies of the military situation demand.

It is organised in six Brigades of Light Horse and three of Infantry.

The Brigade is the highest tactical unit of the Australian Forces.

It is noteworthy that the Brigades are self-contained, thus a Light Horse Brigade is composed of the following troops, *viz.*:—

- (a) *Staff.*
- (b) *Light Horse.*—Three Regiments.
- (c) *Artillery.*—One Battery, Australian Field Artillery.
- (d) *Engineers.*—One Field Company, Mounted Section.
- (e) *Army Staff Corps.*—One Light Horse Supply Column.
- (f) *Signallers.*—Detachment, Corps of Australian Signallers.
- (g) *Army Medical Corps.*—One Mounted Bearer Company.
One Field Hospital.

In round numbers the peace establishment of all ranks of a Light Horse Brigade is 1,100, and the war 2,200.

The composition of an Infantry Brigade is as follows:—

- (a) *Staff.*
- (b) *Infantry.*—Four Battalions.
- (c) *Artillery.*—Two Batteries of Australian Field Artillery.
One Heavy Battery.
- (d) *Engineers.*—One Field Company (Dismounted Half).
- (e) *Army Service Corps.*—One Infantry Supply Column.
- (f) *Signallers.*—Detachment, Australian Corps of Signallers.
- (g) *Army Medical Corps.*—One Infantry Bearer Company.
One Field Hospital.

In round numbers the peace establishment of all ranks of an Infantry Brigade is 2,500, and the war 4,950. The Field Force is drawn wholly from the Militia Branch of the Service.

The Garrison Force.—The rôle of the Garrison Force is the manning of the fixed defences, the defence of vital undefended local points and in the formation of small mobile columns for operations in more or less defined areas.

The distinction between the Field Force and the Garrison Troops is purely tactical, except that the former is composed of Militia while the latter includes the Volunteers.

Armament and Equipment.—Australia has recently spent considerable sums upon armament, arms and equipment. The Field Artillery now have the new 18-pr. gun and the Light Horse and Infantry are armed with the new short rifle.

The Field equipment generally is of the latest pattern.

It is understood that the above organisation is to be modified as a result of the Colonial Defence Committee's Report received from the War Office, upon the Australian Defence Scheme, and its consideration by a special Committee appointed in Australia. The details are not yet available, but it is not thought that any essential details are affected.

The principal objection seems to be to the composition of some of the Brigades which are made up of units separated by some thousands of miles.

To mobilise the 3rd Infantry Brigade for instance troops would have to come from Queensland, South Australia, Western Australia, and Tasmania.

Notes on the organisation generally.—The following brief notes upon the organisation generally may prove of interest:—

Australian Light Horse.—It is to be noted that these regiments are neither Cavalry, because they have no arms suitable for shock tactics, nor can they be said to be Mounted Infantry (though they fight with the rifle on foot) as they are trained as Cavalry and perform all the rôles of Cavalry except that of charging home.

The question of arming them with pistols has been for some time under consideration. General Hutton on occasions tried the experiment of causing these regiments to charge on horseback with the fixed bayonet used as a lance.

To sum up, it may be said that, in the Australian Light Horse, Australia has endeavoured to evolve a mounted arm suitable to her own particular requirements.

Australian Corps of Signallers.—This is quite a new departure in organisation which it is ventured to think will prove a success.

These Corps form distinct units, and are enlisted and trained purely as Signallers. On mobilisation they would be distributed among the various Staffs. They are, of course, supplementary to the ordinary Regimental Signallers.

Transport and Supply services.—These services are administered by the Australian Army Service Corps, almost wholly Militia.

There is practically no organised Transport Service.

Vehicles and horses are obtained by hiring as required, and in case of war a service would have to be improvised.

Medical Services.—There is a well organised Medical Service, well equipped with ambulances and medical equipment generally.

The personnel is almost wholly Militia.

Warlike Stores.—Most warlike stores are obtained from the War Office.

An Australian firm puts together small arms ammunition, but the cordite has to be imported. All clothing, tents, harness, saddlery and articles of a like nature are now made in Australia.

Training.

Permanent Forces.—The regular drills, etc., of the Royal Australian Artillery and Permanent Sections of the Submarine Miners are practically the same as in the Imperial Service.

All officers on first joining have to go through recruit drill in every stage as well as gymnasium, riding school, etc. There are periodical examinations held for promotion of Non-Commissioned Officers to higher rank.

Each Section of Field Artillery and Company of Garrison Artillery is struck off all duty for at least one month every year and goes through its annual training finishing up with shot practice and inspection.

The shooting is of a very high order, and last year nearly every Company obtained a first class.

The Sappers and Miners similarly carry out their annual training and inspection.

In addition the personnel required for all the numerous schools of Light Horse, Field Artillery, Infantry, etc., held throughout the year is found by the Royal Australian Artillery, and consequently the regiment has not only to learn its work as Gunners, but also as Light Horse, Infantry, etc.

The education and intelligence of all ranks is, however, of a high order, and consequently there is no difficulty experienced.

Schools of Instruction.

These are held from time to time as may be directed by District Commandants, the number being based on the amount of money placed at their disposal.

These schools being mainly for the Militia and Volunteer Officers, the hours of attendance are arranged as far as possible to suit their convenience.

No difficulty, however, is found in this respect, in fact the number of applicants is as a rule above that required for a school, and some have often to wait for the next.

The schools last from four days to ten days, and at the end a theoretical and practical examination is held, and those who are successful are given certificates of proficiency.

The courses are classed as follows :—

Class "A" for Senior Officers, Staff, and specially selected Officers.

Class "B" for Squadron, Battery, and Company Officers, and Warrant and Non-Commissioned Officers.

The schools are conducted by a Chief Instructor assisted by Non-Commissioned Officers of the Instructional Staff, and the examination is conducted by the District Commandant assisted by the Chief Instructor.

For a pass, 50 per cent marks must be obtained in each subject.

Pass with honours.—75 per cent of the aggregate.

Distinguished—80 per cent of marks for the subject in question.

The schools are as follows:—

Light Horse, Field Artillery, Garrison Artillery, Military Engineering, Infantry, Army Staff Corps, Army Medical Corps, Signaling and Musketry.

The syllabus of work for each is laid down in the Regulations.

E.g., for Class "A" Light Horse and Class "B" Field Artillery it is as follows:—

Class "A"—

Period of 4 days. Minimum 30 hours.

Synopsis of works.

Manœuvre for Regiment and Brigade.

Tactical movements in the Field.

Strategy of Mounted Troops of all three arms.

Organisation and administration of Mounted Troops, etc.

Class "B"—

Field Artillery.

Period—10 working days.

Synopsis.

Organisation of Artillery Units.

Equitation.

Equipment.

Drill.

Gunnery, Gun laying.

Care and preservation of material.

Entraining and detraining.

Manœuvres.

Fire discipline, and tactics.

Field fortifications, and concealment of guns, etc.

Practice.

Lectures are given on:—

Special duties of Artillery in field. General principles and duties of Mounted Troops in field. Tactical requirements of the—

Three arms.

Tactics of Artillery.

Interior economy and management of horses.

Gunnery Lectures.

Musketry Instruction is divided into two parts—

(a) Long Course.

(b) Short Course.

(a) Duration of one month and consists of practical and theoretical instruction in small arms, and is conducted by a specially selected Staff Officer.

(b) Duration of 8 or 10 days for Officers and Non-Commissioned Officers upon the basis of instruction already referred to under Schools.

Schools of Signalling are held periodically on the system laid down in the text-book of Signalling, and Regimental classes are continually going on in addition.

All Command Officers are responsible that their Signallers are trained in helio, lamps, flags and semaphore, and for the numbers being up to establishment.

Schools of Equitation are also held periodically, and practical instruction is also given regimentally in range-taking, machine guns, etc.

Stuff Rides are held annually in each District lasting as a rule for about three days; they are attended by large numbers of Militia and Volunteer Officers, all of whom are very keen and take great interest in the work.

During the winter months War Games and Lectures are frequently going on at the various United Service Institutions.

Militia and Volunteer Regiments all go through a syllabus of Field Training each year, which is made as continuous as possible, and excellent results are obtained.

A syllabus for each arm is laid down in the Regulations, and the examination of the unit is conducted by the District Commandant or his representative.

The Annual Field Training is quite distinct from the Elementary or Recruit Training which is considered preliminary.

Finally the Annual Continuous Training is held consisting of 8 days' camp for the Militia (except Sappers and Miners who have 14) and 4 for Volunteers.

All ranks are kept going hard all the time from early in the morning till late at night, commencing first with drill and instruction of the several units and going on to brigade, manœuvre, reconnoitring and gun practice.

At manœuvre active service conditions are enforced and one brigade worked against another in accordance with a tactical idea.

In the evenings the work of the day is discussed and criticised, and instructions given for the work next day.

The attendance at these camps is very good, averaging between 80 and 90 per cent of establishment.

Military Science at University.

Although a Military College has not yet been established in Australia, a most important step has been taken in that direction by the establishment of a Department of Military Science at the Sydney University, under Colonel Foster brought out from England specially for the purpose.

The curriculum which commenced last March extends over a period of three years, and consists of individual courses of instruction each terminating with an examination.

Students who have completed the whole curriculum satisfactorily will receive a diploma in Military Science.

Details of the courses together with the fees prescribed are given below:—

Curriculum in Military Science.

First year—

Military History and Science, 20 lectures, Lent Term. Fee 2 guineas. Officers of Citizen Force, half Elementary Engineering, Military. Ten lectures, Trinity Term, with five days' practical instruction probably in the September vacancy. Fee 2 guineas.

Second year—

Military History and Science, 20 lectures, Trinity Term. Fee 2 guineas.

Military Topography, 10 lectures, Lent Term, with seven days' practical instruction probably in the September vacation. Fee 2 guineas.

Third year—

Military History and Science, 20 lectures, Trinity Term. Fee 2 guineas.

Practical Tactics with Staff Rides and War Games, twelve days, probably in the September vacation.

Military Law and Administration, 20 lectures, Lent Term. Fee 2 guineas.

Officers proceeding abroad for exchange and instruction.

In the past officers have been sent at irregular intervals to England for School of Gunnery, Engineering, Musketry, and in some cases to India.

A system of a regular interchange of officers between England, India, and Canada has, however, quite recently been inaugurated, at present on a very small scale, *viz.*, one officer to each country respectively, but it is confidently anticipated that the scheme will be greatly developed and will result in a general reciprocation of matters affecting the defence of the British Empire as a whole, and also be the means of knitting England and her great Colonies still closer together by the social intercourse between officers from all parts thus brought about.

It will doubtless have been noted that one of the resolutions carried at the Colonial Conference recently held in London was to organise one General Staff for the whole of the Imperial Army, and it was suggested by Mr. Haldane, the Minister for War, that a General Staff Officer might be sent from home to any one of the great Colonies to be employed on the Staff there, and similarly one from the Colonies home. This system would doubtless do much to bring about uniformity of pattern in organisation and in other details regarding military matters which is essential if there is to be effective co-operation in a great war. It is sincerely to be trusted that in all future exchanges this proposal will be adopted.

MILITARY LIBRARIES.

BY MAJOR G. F. MACMUNN, D.S.O., R.F.A., P.S.C., D.A.A.G.,

DERAJAT BRIGADE.

Now that Divisions and Brigades are to receive an annual grant of rupees six hundred and three hundred respectively for the maintenance of military libraries, there should be no difficulty in putting these gradually on to a satisfactory footing. These grants are to be spent under the orders of General Officers Commanding, and will presumably be administered by the "Art of War" Staff Officers concerned.

The following notes on the working of small military libraries may be of interest to Staff Officers who have to control them. The first thing is to consider the plan on which the library is to be formed, and this means thinking of the people for whom the library is to cater. There would naturally be the officers of the command, who may be divided into the following classes:—

- (a) Officers who want literature to assist them in the minor studies of their profession and their promotion examinations.
- (b) Those who want to study in the portion of military art, which falls to senior officers.
- (c) Those who wish to study deeply the art of war and command.
- (d) Those who want general reading of biography and travel.

It is evident that classes (a) and (b) will prevail, and must be freely catered for. The object of a military library is to save officers from having to buy and carry about a number of military books. Class (c), however, must not be overlooked. The sort of books in each class would be much as follows: For class (a) the various writings that amplify the training manuals, and deal with the solution of tactical problems, or the fortification of positions, etc., the employment of artillery and the like, as also outlines of strategy and topography; class (b) demand much the same class with some wandering into higher flights; class (c) requires books dealing with strategy and military history. Some of the books required for candidates reading for the Staff College entrance examination should be included in (a).

A military library, however, should not all be school books, as it were, and some interesting semi-military books should be added, such as the lives of Generals and distinguished officers, and the lighter semi-personal experiences of campaigns that are the first to appear when a war is over. It is from biographies and recollections that the history of our own wars and leaders can best be obtained, with the sidelights on the human aspect of war that are so necessary for its right understanding.

It will be well to have two or three copies of the more generally used books in (a) and (b) in a Brigade Library.

Weeding should be begun after even the first year. It is undesirable to keep tactical books that treat of a school that is past, or early campaign pamphlets that are soon amplified or corrected by more comprehensive works.

As regards subscriptions it will probably be found that the Government grant will be the better for some supplement. Corps will probably gladly subscribe some small quarterly amounts, say, from Rs. 5 to Rs. 15 per quarter. It is important that the amount should be small, so that a corps that has subscribed for perhaps three years should not feel that it could have done better for itself had it bought books regimentally. A small subscription, too, makes folk feel that they should get some return by using the books.

II.—The Arrangement of the Library.

For the satisfactory arrangement and cataloguing some division into sections is necessary. As probably an office clerk in the "Art of War" section will look after the library in his spare time, as simple a system as possible is desirable.

The following division is suggested:—

Class A.—Books useful for military examination and minor study,

Class B.—Military science,

Class C.—History,

Class D.—Biography,

Class E.—Miscellaneous,

to which may be added an extra class containing a copy of Regulation books that do not come under A or B, and possibly a class containing language books.

The Cataloguing.

Any simple system will do. The library is never likely to assume unwieldy dimensions, so that complicated systems that prevail of necessity in large libraries are not required. The books may be numbered in each class—A.1, A.2, B.1, B.2, etc.

It costs very little to print catalogues, and, if sold for four annas, the cost is easily recouped. The contractors for Government printing do the work well and cheaply. On starting a library it is a good plan to get a provisional catalogue out at once, as it interests people, and advertises the books available, while a fuller one can be made in twelve months' time.

III.—Stocking a Library.

The amount of money available will not, of course, be very large, and economy is desirable. In starting 18 months or two years' income should be expended, leaving only enough for new publications. A certain number of books will be available from among those issued by Government to Divisions and Brigades, such as the "Manual of

Fortification," "The Duties of the General Staff," Paget and Mason's "Frontier Expedition," Notes on Dogras, Gurkhas, etc., and any gazetteers and handbooks that are not "confidential."

Nearly all lives and histories can be obtained, second-hand, from "Mudie's Second-Hand List," or the "Times'" Book Club at very much reduced rates, in excellent order. Mudie's has the larger selection in most classes. Tactical and purely strategical books must, as a rule, be bought new. Several book-sellers will give special terms of discount to a military library. The officer who is running the library should get "Mudie's Second-Hand List," the "Times'" Book Club Lists for classes A, B, and C, the Army and Navy Stores Book Circular, Hugh Rees' Circular (in Pall Mall), and doubtless many others sent him regularly.

The journals of all the military societies should, if funds permit, be taken, or often some officer will present them. The United Service Institution of India Journal should, of course, be taken in, and the Cavalry Journal. Those of the Royal Artillery and the Royal United Service Institution are also desirable. A few books of reference are desirable such as "Haldyn's Dictionary of Dates," and three or four atlases of which names are given further on. The General Staff at the War Office now publish a pamphlet reviewing all the latest books on military subjects as well as noting on British and foreign magazine articles.

Furnishing and Location.

If the Brigade or Divisional Office is in a central position, a room in it, a spacious room if possible, is by far the best place, so that the Staff Officer in charge can look in when he has spare moments. If these offices are not convenient an endeavour should be made to get a central place. It often happens that the Station Club, or Station Library Committee can lend a room. In the latter case it will be necessary to arrange for a clerk or babu from the Staff office to spend an hour there in the evening straightening out books.

The library should be open as late as possible, and should specially open on Sunday, when officers wanting books have time to go and look for them. If the library is in the Staff Office, it is sound to arrange to send books to officers who send or write post cards for them, and generally to make it as convenient as possible, in fact to hold the nosebag for them to feed.

Barrack store, or R. E. office furniture almirahs can generally be got, but as funds permit the glass-doored variety, as used by the local Parsee store-keeper, is excellent and more enticing. A good writing table, with stationery, fresh ink and *clean* pens also add to the attractiveness of the institution.

Confidential Libraries

Now that an ample issue of confidential books has been made by the Chief of the Staff to General Officer Commanding, it is in accordance with his wishes that these should be made as accessible

as possible to officers of the garrison. It is convenient to classify these Z, Y, X, etc., as North-West Frontier, North-East Frontier and China, Africa, Europe, etc.

In most cases copies have been sent for issue to each unit. These have all to be handed back by corps leaving the command, and the "Art of War" Staff Officer is responsible for their correct return. It is suggested that if library funds permit a small polished, locked cupboard, containing one set (with room for increase) with inventory pasted on the inside be issued to each Commanding Officer for use in Orderly Room or Mess. These cost some fourteen rupees a piece, and save immense trouble to all concerned.

Book Lists.

The following list of books is given suggesting what may be useful in each section described. They only purport to be a nucleus, and doubtless others will occur to any one reading this. "M" against any book means that it can be bought from Mudie's Second-Hand Book list, and "T," from the "Times" Book Club. The prices of almost new books from these second-hand lists vary from thirty to fifty per cent. of the original net price, and they are sent with all library labels removed. In class D—Biography—new, well bound, and well printed books are for sale at extremely low second-hand rates, and are well worth getting, as they fill an attractive cupboard for a small cost.

CLASS A.—(*Books useful for Military Examinations and Minor Study*) (*two or three copies of most of these are desirable*).

Tactics and Training. Tactics of To-day.—Caldwell. 2s. 6d. Blackwood.

Problems in Manœuvre Tactics.—Crowe. 6s.

The Infantry Weapon and its Use in War.—Maine.

Quick-Firing Field Artillery.—Rocquerole.

Letters and Essays.—Maude.

Questions and Answers on Combined Training.—Gall. 3s.

The Solution of Tactical Problems.—Needham. 3s. 6d.

Frontier Warfare.—Younghusband.

Strategy and History. Modern Strategy.—James. 16s. Blackwood.

Military History and Modern Warfare.—Donaldson. Thacker, Spink.

Topography ... Military Sketching and Reconnaissance.—Mockler Ferryman. 6s.

The Manual of Topography. Official publication.

- Military Law* ... Military Law, Procedure and Practice.—*Pratt*.
 Military Law Made Easy.—*Banning*. 4s. 6d.
 The Manual of Military Law —*Official* (usually spare, available in Staff offices).
- Geography* ... Military Geography —*Maguire*.
 Hand-Book of Navy League —*Secretary, Navy League*. 1s. 6d.
 Geographical Series. "The World." Longman
 Johnston's "World Wide" Atlas. 5s. 7½d.
 Bartholomew's "Century" Atlas. 2s. 7½d.
 Newne's "International" Atlas. 6s.
- Various* ... Organization and Equipment Made Easy—*Banning*. 4s. 6d.
 Staff Rides —*Marindin*. 2s.
 Small Wars, Their Principle and Practice.—*Caldwell*. War Office.
 The Manual of Engineering.—*Official*.
 Practical Gunnery.—*Russel*. 2s. 6d.
 Provisional Memoranda. *Indian Staff College*
 (Obtainable from the Commandant; several copies required).

CLASS B.—(*Military Science*).

- Operations of War.—*Sir E. Hamley*. 22s. Blackwood.
 War.—*Clausewitz*. Kegan, Paul and Trench.
 Military Operations and Maritime Preponderancy.—*Caldwell*.
 15s. Blackwood.
 The Development of Strategical Science.—*Von Caermeyer*. 6s.
 Hugh Rees.
 The Evolution of Tactics.—*Gilbert*. 7s. 6d. Hugh Rees.
 War and the World's Life.—*Maude*. 12s. 6d. Smith Elder.
 Science of War.—*Colonel Henderson*. 14s.
 The Principle of Land Defence.—*Thuillier*.
 Lines of Communication in War.—*Furse*.
 Provisioning Armies in the Field.—*Furse*.
 The Nation in Arms.—*Von der Goltz*.
 Cavalry in Future Wars.—*Von Bernhardt*. 10s. 6d. Murray.
 Cavalry on Service.—*Von Pelet Narbonne*. 7s. 6d. Hugh Rees.
 War.—*Maurice*. 3s. 6d.
- M. Imperial Strategy.—*Times' Correspondent*.
 Lessons of the Russo-Japanese War.—*General Negrier*.
 Naval Policy.—"Barfleur." Blackwood.
 The Evolution of Infantry Tactics.—*Maude*.
 Military Maxims of Napoleon. 1s. 6d.
 The Duties of the General Staff.—*Von Schellendorf*. (*Official*.)

CLASS C.—(*History and Geography*).

- Wellington's Campaigns, 1808—1815. Parts I, II, and III.—*Robinson*. Hugh Rees.

- Russo-Turkish War, 1877.—*Maurice*.
 Saarbruck to Paris.—*Simson-Pratt*. 5s.
 The People's War in France.—*Lonsdale Hale*. 6s.
 The Afghan Wars.—*Archibald Forbes*.
 M. Sea-Power in its Relation to the War of 1812.—*Mahan*.
 M. The Influence of Sea-Power on History.—*Mahan*.
 The Battle on the Shaho.—*Von Donat*. 7s. 6d
 The Battle of Spichenen.—*Henderson*. 5s.
 The Franco-German War.—*Von Moltke*.
 The Indian Mutiny.—*Kaye and Malleison*.
 A Century of Continental History.—*Rose*. Stanford.
 M. "Times'" History of the S. African War.
 T. A History of the Civil War in the United States.—*Birbeck and Edmonds*.
 T. The War in the Far East.—*Times' Correspondent*.
 M. The Chitral Campaign.—*Thomson*.
 M. Tirah.—*Hutchison*.
 The Panjab in Peace and War.—*Thorburn*. 12s. 6d. Blackwood.
 The Indian Borderland.—*Holditch*.
 M. Thibet.—*Holditch*.
 M. The Re-shaping of the Far East.—*Putnam Wheale*.
 M. A Staff Officer's Diary.—*Sir Ian Hamilton*.
 A Study of the Russo-Japanese War.—*Chasseur*. 6s. Blackwood.
 M. The Sikhs.—*General Sir John Gordon*. 7s. 6d. Blackwood.

CLASS D.—(*Biography*).

- M. Life of Marlborough
 M. Life of the Duke of Wellington.—*Sir H. Maxwell*.
 M. Diary of Sir John Moore.
 Life of Napoleon.—*Rose*.
 Life of Nicholson.—*Trotter*.
 M. Life of Sir Henry Daly.—*Major Daly*.
 Stonewall Jackson —*Henderson*. 16s.
 M. Eighteen Years in the Khyber.—*Warburton*.
 M. Life of Sir Evelyn Wood.
 M. Autobiography of Sir Harry Smith.
 M. Life of Lord Gough.
 M. Redan Wyndham.
 M. Military Life of the Duke of Cambridge.
 M. Life of Sir George Pomeroy Colley.
 M. Colonel Alex Gardiner (an adventurer).
 M. Life of Sir E. Hamley.—*Shand*.
 M. Forty-one Years in India.
 M. Life of Lord Wolesley.
 M. Wellington Lieutenants. — *Shand*.
 M. My Life in India.—*General Sir L. Vaughan*. (Vaughan's Rifles, F. F.)
 M. Journals of F.-M. Count von Blumenthal.
 Napoleon as a General.—*Worttemberg*.

DOUBLE-SHOTTED CARTRIDGES.

By M.

During the last two years several burst rifles have been sent to the Government Experts for examination. Most of these weapons were found to be without flaw, and no explanation could be offered as to how they became damaged. The cause has, however, recently been discovered; and has excited a considerable amount of interest, not only in India and at Home, but also in the Colonies.

Not long ago one of these burst rifles arrived at a Government factory for inspection. A large hole had been blown out through the extractor-way, the bolt-head was shattered, and the body was much damaged. The bolt was jammed, and could not be drawn back; but through the opening caused by the explosion a bullet could be seen lying inside the shattered cartridge-case, *with its point towards the chamber*. The bolt was eventually knocked back and the cartridge-case taken out. The base of the latter was nearly all blown away. The rifle had evidently burst on account of the barrel having become choked up by a bullet trying to enter its base first; but the question was how it got there in that position? It was the fact of its being found reversed that gave the clue which led up to the discovery of the cause of the accident. There must, of course, have been two bullets in one cartridge, one of which had somehow become inserted amongst the strands of cordite so that the two bullets were base to base. The first bullet had evidently passed out of the barrel, while the second one remained in the chamber. Now in order to have completely closed the barrel against the passage of gas, the second bullet would have had to have entered the rifling, which would have compressed it at the base; and in addition the bands would have cut deeply into it. On examination, however, there were no marks of rifling to be seen on the bullet at all. The core of the bullet was slightly protruding from the envelope, which latter had splayed out a little, something like the mouth of a cornet. This proved either that it had been driven up the lead of the rifle at such a low rate of velocity that the force with which it tried to enter the rifling was barely sufficient to alter the shape of the bullet; or, that the explosion of the charge and the bursting of the rifle had been almost simultaneous. The barrel could not therefore have become completely choked, because if it had, the second bullet would have been found stuck in the barrel, whereas it was loose in the chamber; but it must have checked the rush of gas into the barrel considerably, and so partly caused the damage.

There could be no doubt about there having been two bullets in the cartridge-case; the only question being 'how such a cartridge came to be made? It is not possible to fill with cordite a cartridge

case containing a loose bullet; but it is possible to force, by machinery, a bullet into a cartridge-case which contains a full charge of cordite, and then to fix another bullet correctly into the mouth of the case. Such a cartridge looks exactly like an ordinary one and will stand all the tests which are applied at ammunition factories, except of course that of weighing. A trained soldier might possibly detect a double-shotted round by the extra weight and the difference in the balance of it when handled, as it is not top-heavy like an ordinary cartridge.

Some experiments with these double-shotted cartridges have recently been conducted and the results are given succinctly below. The explanation may not be considered full, but the subject is still in a nebulous state and the caprices of cordite are perhaps not yet fully understood even by the esoteric class.

Ten specially prepared rounds of ammunition were fired from Lee-Metford rifles. These cartridges were of service specification in every particular except that they were double-bulleted; five of them having the two bullets point to base, and the other five base to base. In the example of the first kind both bullets passed out of the barrel in every instance, without doing any damage to the rifle at all. But in the cases where the bullets were base to base, the rifle burst every time exactly as it had done on the range where the accident occurred which led to these experiments. That is to say, the explosion, taking the line of least resistance, invariably blew a hole through the extractor-way, shattering the bolt-head at the same time. In the latter instance the second bullet always remained in the barrel near the breech, except in one case when both bullets passed out of the barrel altogether. This was particularly interesting, because, had such a round been fired on the range, there would have been nothing whatever to account for the burst.

The introduction of a second bullet into the cartridge-case diminishes, of course, to the extent of its own volume, the air-space therein, and raises the pressure of the gases of the fired cordite. The presence of two bullets would also mean greatly increased friction, and therefore the burning of the cordite would be further advanced before the bullets began to move. The explosion of the cordite fired in this smaller space and under circumstances of greatly restrained expansion instead of creating a comparatively gradual propelling force, would be of a detonative nature on account of the temperature being higher than under normal conditions. In spite of these facts, it is interesting to note that the rifles used in these experiments managed to stand the increased strain; and that in one of the instances where the two bullets were point to base was the rifle in any way damaged beyond a setting up of the resistance shoulders. One important fact therefore which was established is that if the two bullets in double-shotted rounds are base to base the rifle is certain to burst; whereas, if they are point to base it ought not to be damaged at all. The reasons for this are, firstly, that a sudden and violent strain is occasioned by the combined

effect of the base of the reversed bullet (.311) striking the top of the lead, together with the simultaneous checking of the expansion of the gas; and, secondly, that the gas cannot exert any pressure at all on the base of the first bullet, whereas when the bullets are point to base it can; and greater pressure is therefore required in the first instance than in the second.

It is now certain that the double-bulleted cartridge has been the cause of many accidents in the past which could not be explained at the time. As regards the cartridges themselves, I am credibly informed that the defect has occurred sporadically in ammunition of almost every manufacture and especially in that made in Australia. Until very recently the automatic machines by which each round is weighed, only rejected light cartridges, as the possibility of heavy ones was not contemplated. They have, however, now been altered so as to reject heavy ones as well. The supposed reason for the number of double-bulleted rounds being found in "R. L." ammunition is a curious one and is as follows. The factory hands resented the introduction of automatic bulleting machines; and every now and then two bullets were purposely inserted into one cartridge case in order to try and get the machines condemned. The war in South Africa is probably answerable for the way in which any packet containing such a cartridge, managed to get through undetected, as most of these rounds were made in 1900. The Chief Inspector of the Royal Arsenal at Woolwich would no doubt be glad to receive the number of the box containing any ammunition of this description so as to assist him in investigating the cause.

MISCHENKO'S RAID ON YINKOW IN JANUARY 1905.

Being chiefly a translation from the Russian of Colonel Sveshnikoff, who commanded a Cossack Regiment in the raid.

BY CAPTAIN A. W. F. KNOX, 58TH VAUGHANS RIFLES F. F.

**Introductory note on
the strategical situation
in January 1905.**

After the indecisive battle of Shaho, there came a pause in the active operations. From the middle of October 1904 till the end of January 1905, both the Russians and the Japanese were content to dig themselves in, accumulating technical appliance in aid of the passive defensive. European critics at the front very possibly thought for a time that this pause was the result of the intense cold of the Manchurian winter and described it as a return to the strategy of the 17th and 18th centuries, when armies went annually into winter quarters.

The real reason, however, was rather military than climatic. The Russians had learnt that they could not hope for victory without large reinforcements. Their idea was to confine themselves to the passive defensive till the arrival of overwhelming reinforcements would enable them to assume the offensive with substantial hope of success.

The Japanese waited for the fall of Port Arthur to set free 70,000 men and much heavy artillery, which, properly applied at the decisive point in the north, might win them the Sedan they dreamed of.

We have the Russian army fed by a strong continuous stream from the west and the Japanese army with units only just kept up to strength by a trickle of men from the east.

Every additional day that Port Arthur held out assured Kuropatkin of an addition of so many hundred fighting men in the next great battle.

When Port Arthur once fell, it would be a simple calculation to fix how soon its last besieger could be transferred to the front, and that day the Russian Commander would be at his weakest.

Port Arthur fell on January 1st.

The Japanese could count on massing 13 active Divisions and 13 Reserve Brigades, say, 300,000 men, at the decisive point by the middle of February.

The Russian would have 325,000 men south of Mukden. Eight days after the fall of Port Arthur, Mischenko's raid was launched from the Russian right.

The following is a rough translation* of an account, published thirteen months later by Colonel Sveshnikoff, who commanded the 1st Chitinsky Cossack Regiment in the raid.

* NOTE.—The marginal headings and footnotes only have been inserted by the translator.

7th January 1905.

The lamps had been lit some time and dimly flickered in the long shed attached to the hospital of the **In Mukden Hospital.** Red Cross Society. There was one hanging lamp, and from the corner where it was were heard groans from time to time—there was a Cossack dying there. As the groans increase in volume, they infect other wounded and sick; first one hears sighs, then cries to God for help, bitter sobbing;—a second voice starts accompanying the dying man, and then the whole ward groans in unison. The wail now dies away, now increases in volume.

The tired nurse on duty in the ward tears herself away from the book she was dosing over, stands up to listen and, with an un-failing instinct, goes straight to the patient, who is really suffering and needs her help. She smooths his pillow and busies herself about him, but might have spared herself the trouble, for he is in delirium and already dying! She passes from him to another with noiseless tread and finds a kind word of encouragement for every one.

"Is he very bad?" I asked.

"He'll die to-night, the third to-day."

And she was right. Towards morning I was awakened by measured steps passing my bed. The hospital attendants were carrying his corpse out on a stretcher.

But that night I had other things to think of. This raid, that people had been talking of for months, without any pretence at concealment, was really to take place. At first it had been spoken of in confidence, then every one talked of it openly, adding even the names of the regiments that would take part in it.

The coming raid.

Up to yesterday evening there had been various reports as to who would get the command. It was stated that General Mischenko had refused it on the grounds of his want of experience in cavalry work, and that General Rennenkempf was to be appointed, but everything had been cleared up now. We are to go to Yinkow, the force is to be a large one and is to be commanded by General Mischenko.

From early morning I waited the doctor's arrival impatiently, for I longed to hear what my temperature was. It was a little above normal yesterday, but I had made up my mind to rejoin my regiment to-day, at all costs.

The idea of my being left behind! The raid on Yinkow starts to-morrow and the regiment I command is to take part. The idea that I should be left behind, I who have served for twenty years in the cavalry and am devoted heart and soul to my profession. Remember this is a cavalry raid, the dream of every horse soldier. How often have I dreamt of it myself at night, after days spent in reading of the raids in the American war and of our partisans! A raid, of which every one dreams and for which every one longs, from the youngest Cossack to the oldest Cavalry General!

I was ready early and walked up and down the ward to test my strength. In spite of the representations of the doctors and nurses, I ordered a trap and made up my mind to set out immediately after dinner, as my regiment was some 20 miles distant. My temperature was exactly the same, so they loaded me with medicines and gave me no end of advice, warning me what I might eat and what I was not to eat, and finally let me go with the best of good wishes.

I won't write of my drive to the regiment. It was cold and windy and the road from Mukden to the village where it lay is unimaginably boring and monotonous. The villages along the road were mostly in ruins and only the bare walls of the huts and, at times, the bark of starving Chinese dogs bore evidence to the fact that here, once upon a time, life hummed with its varied interests, its sorrows and its joys.

I arrived late. When I had heard the report of the officer on duty I gobbled down some food and set about collecting the simple belongings one can carry on half a mule. I had a look at my horses and turned in in the best of humours, excited by the thought of the coming raid. Orders were brought me two hours later.

Seefantai was fixed as the starting point for the raid and units were to assemble there independently by 1 P.M. on the 8th. This meant a march of $21\frac{1}{2}$ miles. The men were to get hot dinners at Seefantai and move into bivouac at 3 P.M. on the line Ubanure-Matienza.

8th January 1905.

It had dawned, but the shadows still lay deep in hollow and ravine, when I was roused by the uproar, which always accompanies the start of a regiment, quartered a certain time in one place.

Behind the stone wall, separating the enclosure of my hut from the next, I could hear Cossacks' voices—my orderlies who had just awakened. Cossacks appeared in front of my hut, with their cloaks slung around them, and began to work with feverish haste. The bivouac fire crackled merrily. My orderly was standing by it with a stick in his hand on which my tea kettle and his mess tin proudly swung. The Cossacks collected to drink tea. Some orderlies were running along every street, helping their masters to get ready, and, as a matter of fact, they had their work cut out for them, for each officer was only allowed half a mule.

The march was carried out under peace conditions. We took no measures of protection and even sent a party ahead to take over quarters. Every one knew where and why we moved. The concentration in the village of Seefantai was carried out without any attempt at concealment.

On arrival at Seefantai, I was met by my Quartermaster, who handed me a message from an officer, who had been sent on ahead,

to the effect that huts had been told off for the regiment in the village Tuerto,* $2\frac{1}{4}$ miles north of Seefantai. This was dated 11 A.M., 8th January.

I turned off with the regiment in the direction of this village, secretly glad that I was not to bivouac near headquarters, for the proximity of the staff always entails unexpected and often unnecessary work on the rank and file. However on the road there, I received a second message from the same officer, dated half an hour later. We were to go to the village of Seefantai and to bivouac at the northern gate behind the Ural Regiment. Preserved meat and cabbage soup had been drawn for us.

So you see, even before the raid had started, thanks to the want of *bundobust* of the staff, the rank and file only got meat and had to go without a proper dinner.

As only half an hour elapsed between the two messages, one would have thought that something particularly important had necessitated the change. Still, when I had got the regiment to Seefantai, no one worried about us, and we stood for more than four hours, in one place, with the thermometer 2° below zero.

The truth of the matter was that the receipt of fresh information about the enemy had necessitated the cancelling of the orders first issued, and, after consulting with his column leaders, General Mischenko ordered them to bivouac, not on the line Ubanure-Matienza, but in villages in the immediate vicinity of Seefantai.

In this way, on arrival in Seefantai, our regiments were all moved forward, and according to the columns to which they were detailed bivouaced in villages $1\frac{1}{2}$ to $2\frac{1}{4}$ miles to the south. My regiment was detailed in the instructions as escort to the pack transport, an independent column in itself.

The transport to the number of 1,500 horses and mules was in Seefantai and no one knew what to do with me as there was no place left to put me.

After the lapse of two hours, I managed to get hold of General Abramoff. He was astonished that I was not in Tuerto, and told me to go to a village a mile and a half south of Seefantai, and bivouac next to the 1st Verkneudinsky Cossack Regiment. I protested that I did not belong to that column, that my starting point was Seefantai and that I was in command of an independent column, but the General repeated his order, adding that everything would shake out to-morrow.

I could do nothing and so returned to my half-frozen regiment, indignant beyond measure. Here I received an order from the Chief of the Staff of the Force to remain in Seefantai. I told General Abramoff of this and rode off to look for billets. Here again I was unsuccessful. There were no unoccupied huts, for, when headquarters recalled me from

* See sketch 1.

Tuerto, they did not worry about such a trifle. Only at 9 P.M. did we succeed in finding room for the regiment and then only thanks to the kindness of an officer of the Frontier Guards who doubled up some hundreds of men with his own people and handed over to others the huts told off for men on duty.

Orders were handed out in the evening.

ORDERS.

SEEFANTAI:

8th January 1905.

Force Orders, 8th January 1905—(see Sketch 1).

The enemy is in occupation of the line of the river Hunho, with 3 infantry regiments, 8 squadrons and 4 guns

The enemy. in the villages A—B. Advanced detachments, each of a strength of 1 battalion, 1 squadron and 2 guns are posted in the villages C and D. He has strong piquets in the villages F and E (2 companies, 2 squadrons, 2 guns), G (1 company, $\frac{1}{2}$ squadron), H ($\frac{1}{2}$ company, 1 troop), and K (1 company, $\frac{1}{2}$ squadron). He has supports in the villages L and M (2 battalions, 3 squadrons). There are machine guns in each piquet.

The enemy's reconnoitring patrols go as far as the line N, O, Matienza, Ubanure, P, Q. Three thousand, 3,000, mounted and dismounted Chinchuses in the Japanese service are reported on the line A-Davan. Our advanced guard, from General Kossagovsky's command, is at the village R, covered by outposts.

The force under my command will continue its march to-morrow to the line Talinpuza-Davan. To this end:—

General Talesheff's column:—
Division of Cossacks of 18 sotnias.
the Don.
Caucasian Brigade ... 11 do
Mounted Infantry ... 6 do
2nd Caucasian Battery. 6 guns.
8th Sotnia Frontier 1 sotnia,
Guards.

Total 36 sotnias, 6 guns.

Will march at 8 A.M. from the village S. by Ubanure, to Davan, where it will billet for the night in neighbouring villages. Midday halt near the village of T. up till 2 P.M. Collision with the enemy is to be avoided.

General Abramoff's Column:—
Ural Brigade ... 10 sotnias.
1st Verkneudinsky Regi- 5 do.
ment of Cossacks.
Mounted Infantry 4 do
1st Trans-Baikal Cossack 6 guns.
Battery.
41st Sotnia of Frontier 1 sotnia.
Guards.
Red Cross Detachment ...

Total 20 sotnias, 6 guns,
and 1 Red Cross Detachment.

Will march at 8 A.M. 9th January from V by P to Davan, where it will billet in neighbouring villages. Midday halt $1\frac{1}{2}$ miles S. of Q. up till 2 P.M.

Colonel Sveshnikoff's Column:—
 1st Chitinsky Cossack 6 sotnias.
 Regiment.
 40th Sotnia Frontier 1 sotnia.
 Guards.
 Pack transport ... 1,500 ani-
 mals.

Total 7 sotnias, 1,500 animals.

General Samsonoff's Column:—
 Composite Dragoon 18 squad-
 Division. rons
 3rd Sotnia Frontier 1 sotnia.
 Guards.
 20th Horse Battery... 6 guns.
 Q.-F. Battery ... 4 do.

Total 18 squadrons, 1 sotnia
 and 10 guns.

Will march from Seefantai at 7-30 A.M.
 by Q to Davan, where it will bivouac for
 the night. Midday halt lasting till 2 P.M. at
 village.

Will march at 8 A.M. from the village
 Yaohuandi to Q, where it will cross the river
 Laio Ho and continue march to Talinpuza,
 where it will bivouac. Midday halt at village.

2. Units will be guided by regulations on the march.
3. Columns will keep close to the river Laio Ho marching by
 Colonel Sveshnikoff's column.
4. I will be in General Abramoff's column.
5. General Telesheff and General Samsonoff are empowered
 to act for me.

(Sd.) GENERAL MISCHENKO.

It was an easy matter to issue these orders. To carry them out
Difficulty as to maps. was impossible owing to the complete absence
 of local maps. The names of these villages
 conveyed nothing to us. If the column had been here some time,
 we should have got to know the country in front. As it was, we
 had only arrived that day and on the next were to march into a
 hostile terrain, completely unexplored and reported to be infested
 with Chinchuses.

I sent the Adjutant to the staff to ask for maps. He was told to
 get Chinese guides and we were reminded, to console us, that we had
 a Sotnia of Frontier Guards, the men of which were acquainted with
 the country. But how could one possibly entrust the leading of a
 whole column to a Chinese guide, in a country known to be hostile,
 or to a soldier?

I sent back to the staff to say that, if they did not give me some
 map or other, I would complain to General Mischenko. My protest
 had some effect for two hours later they sent me a map drawn on
 tracing paper. But, Heavens! what a map it was! not only was
 there no attempt to show the shape of the ground, but even the
 smaller villages were omitted and the names of several others were
 incorrectly entered.

Late in the evening an order was received, calling for volunteers
 for a raid on the railway south of Haicheng.

9th January 1905.

First day's march,
 9th January 1905.

In the morning a slight frost with no wind.
 It promised to be a splendid day.

According to my orders, I was to march at 7-30, but long before that I was busy with the pack animals, who, to say the least of it, caused me much anxiety.

They were divided into five corps. Each corps was sub-divided, to use a metaphor, into "links," each of which consisted of a driver with five horses or mules, including the one which he rode. In three corps the drivers were mounted on horses, in one on mules and in one they were on foot. The animals of each "link" were tied, head to croup.

Loading the transport was a long job as each driver had at least five animals to load. The ones first loaded

Difficulty in loading. got tired of standing and showed a tendency to lie down. It was impossible to get them up again without first removing their loads. For this reason, we had to load up a whole "link" and start it going and then load the others in succession. The animals tied together at first pulled against one another, so it often happened that a link came to a standstill or actually sat down, oftener still that they started kicking and then the wooden Chinese saddle slipped on one side and we had to start everything from the beginning again. The loading gear was evidently made in a hurry, as cheaply as possible, and broke at every step. Indeed I was astonished to see, even on the first day's march, that many straps had been replaced by string. Both horses and mules were in miserable condition and anything but fit for hard work.

It only remains to add that the drivers were irregulars, absolutely devoid of discipline, who got drunk on native liquor, even during the raid.

As drivers they were indifferent, some marching on the proper front, but watching their opportunity to wander off to a flank or else lag behind, which of course dragged out the length of the column.

On the 9th January, I came to the conclusion that the raid would have no useful result; that it was not a raid, but a clumsy, spiteful, practical joke. I found out afterwards, I am glad to say, that I was wrong, that the neglect of elementary principles such as, if a column is required to go fast, it must be lightly laden, if it is to effect a surprise, its movements must be concealed, or in any case not be publicly discussed some two months before it starts, would not have prevented brilliant results, if still more stupid mistakes had not been made.

I began my march punctually at 7-30 A.M., sending one sotnia ahead as advanced guard.

As my column moved past the large villages on the banks of the Laio Ho, the Chinamen ran out of their houses and sat on the mud walls to watch us pass. I was convinced that there were numbers of Chinchuses among these grinning good-natured natives and that the news of our intended raid had long been common property. As a matter of fact,

The population hostile.

when I had only gone a few miles from Seefantai, my approach was heralded in each village by peals of temple bells and men were seen to gallop off towards the south.

Meanwhile the transport stretched for 3,500 yards and moved about $1\frac{1}{2}$ miles an hour. In order to shorten the column, I ordered the drivers to march four abreast and distributed a whole sotnia among the transport to make the animals keep up. Still this did not help much, for we constantly came to defiles when only one or two could march abreast.

For some time I seemed to have lost touch with the other columns, but at last a patrol of General Samsonoff's explained matters. It appeared that the other columns, although moving at a walk, had outstripped me and I was now quite unprotected. I sent out additional patrols, and despatching half a sotnia as a flank guard, hurried up the transport, thinking I would catch up the other columns, at the midday halt. In this however I did not succeed, for they moved on at 2 P.M., as ordered and I only arrived at 5-30 P.M., $3\frac{1}{2}$ hours later.

It was quite dark when a messenger from General Mischenko rode up and handed me over the following instructions:—

"General Mischenko orders you to bivouac near Davan. He wants to see the Chief Transport Officer at once. The General says you must get to Davan somehow or other. There are no empty huts even for the officers. The wells are all dry."

PRINCE VADBOLSKY, C. of S.

I gave a sigh of relief when I reached our outposts. I left a sotnia on outpost fronting north, and went with the Chief Transport Officer to the General, where the former, poor devil, had to listen to some unpleasant home truths.

The other columns had marched as ordered at 8 A.M. They moved the whole time at a walk, halting for ten minutes in each hour.

The 4th Ural Cossack Regiment which furnished the advanced guard of the centre column had a skirmish with 300 Chinchuses, whom they drove south of Davan, capturing 23 arbas full of provisions.

The transport threatened to delay the whole column, so General Mischenko ordered units to lighten it by taking two days' supplies of provisions and forage and supplemented the ambulance teams with horses from the captured carts.

The following is a short summary of the author's comments on the work of the 9th January:—

1. Columns had been specially ordered to march by mine.

Not only was this not done but General Abramoff even omitted, from the very start, to send out contact patrols. The consequence was that my column,

Neglect of orders.

An attempt to lighten the transport.

Criticism on first day's March.

instead of being covered from the south by the neighbouring columns of Generals Abramoff and Telesheff, was for some time quite unprotected.

2. The practice of carrying out the whole march at a walk led to a late arrival in camp. Outposts had to be put out at night and the difficulty of

Outposts.

getting touch in the darkness caused gaps between the outposts of the different columns. This was the case even on the 9th January. My regiment faced north and got into touch with the regiment on the right, but it was found impossible to get into communication with General Samsonoff's column beyond the river, owing to the breaking ice.

Touch was only obtained at dawn. This, in my opinion, was risky, for we might have been attacked from any side, if not by Japanese, at all events by Chinchuses.

3. It seems a mistake to have sent General Samsonoff's column across the river. As this column recrossed

Use and abuse of a parallel obstacle.

to the east bank on the following day, it would appear to have been originally sent either to protect our right flank or for convenience in billeting. The river Laio Ho was, by no means, fordable everywhere and the steepness of its banks rendered its passage by artillery in most places impossible. In a hostile country one should be prepared for all eventualities. If General Samsonoff's column had been attacked at night by a large body of Chinchuses, led by Japanese, we could have done nothing to help him. The detachment of one regiment without artillery would have been sufficient to guard our right flank.

4. From the very first day the transport showed itself in its true colours, and in order to lighten it, we were

Transport

ordered to take over two days' supplies of food and forage. This overloaded the troop horses.

The following orders were issued in the evening:—

DAVAN:

9th January 1905.

ORDERS:

Orders, 9th January 1905—(Sketch 1)

Advanced detachments of the enemy to the strength of 300 men were met with some three miles south

The enemy.

of Davan; according to information received from the Chinese villages south-west and south-east of this point are occupied by small bodies of Japanese. From the same source villages "A" and "B" are reported to contain large stores of supplies and in "A" are 2,000 infantry with 12 guns. Fifteen miles west of Davan there is a band of Chinchuses under Tulesan.

The columns.

The march will be continued to-morrow in the direction of old Newchwang.

General Telesheff's column (on the left) will march at 7 A.M. by main road to Kaliho and there cross the river Hun Ho.

(Here follows detail of central column under General Abramoff, with which the transport column of Colonel Sveshnikoff is incorporated. The advanced guard and rear guard of this column are detailed. Advanced guard is ordered to march at 7 A.M., main body at 7-30 and rear guard is to follow at a distance of 1,200 yards.)

1. "Orders as to midday halt and bivouac will be given in Kaliho. It is 10 miles to Kaliho. The midday halt will probably be 7 miles south of Kaliho.

2. While on the march, the advanced guard, main body and rear guard must all detail special flank guards in addition to the ordinary contact patrols.

3. While on the march to-day, to-night and to-morrow the General Officer Commanding enjoins on all reconnoitring patrols, particular care and redoubled energy.

4. An officer's patrols, strength one troop, is to be sent out along the road to Kaliho at 6-45 A.M. This patrol will be detailed by the Verkneudinsky Cossack Regiment.

5. A sotnia of the Frontier Guards will march at the head of the main body, furnishing one troop to the advanced guard and three guides to the patrols.

6. General Samsonoff's column (right) will march at 7-30 A.M. along the bank of the river Laio Ho to the village Duhuandi and thence straight on Kaliho.

7. Patrols of one officer and six Cossacks will be sent from the Chitinsky Cossack Regiment to General Samsonoff's column and from the 4th Ural Regiment to the column of General Telesheff. The 5th Ural Regiment will detail one officer and two men as orderlies to the G. O. C. the force.

8. The 4th Ural Regiment (on outposts) will join the column when passed by the advanced guard of the 1st Verkneudinsky Regiment.

9. Starting point of main body—south of Davan.

10. The 5th Ural Regiment (rear guard) will relieve the Mounted Infantry detachment on outpost in rear.

11. Both the O. C. advanced guard and of the main body will take guides

12. Halts only when ordered.

13. When crossing rivers, the ice must be carefully tested and, if necessary, artificially strengthened.

(Sd.) GENERAL ABRAMOFF.

10th January 1905.

**2nd day's march, 10th
January 1905.**

I started with my regiment at the head of the main body of the central column, at 7-30, as ordered.

After we had gone some distance alarming reports began to come in. A hot fire was opened on the advanced guard at the crossing of the Hun Ho.

About 11 o'clock I received an order to move the regiment on at a trot and attack the enemy's transport.

Passage of the Hun Ho
(see Sketch 2).

In reply to my question as to where the transport was and in what direction it was marching, General Abramoff said that it was moving west to east, on the ground south of where we were.

I sent out covering patrols, deployed the regiment under cover of a small hill and rode up to the top with my orderlies,—but could see nothing.

Meanwhile this is what had happened.

As detailed in orders the 1st Verkleudinsky Regiment formed the advanced guard of the central column. On arrival at the river, its patrol and those of the left column were fired on. This was no more than we expected, for the officer's patrol had already reported the village of Kaliho occupied by a band of Chinchuses.

The attack was prepared by gun and rifle fire and the 1st Verkleudinsky Regiment crossed the river at 11 P.M. and advanced against the Chinchuses. In the centre, the first sotnia dismounted and drove the enemy out of the village; to their left, the second sotnia cut another group to pieces, while on the right the fifth sotnia supported by the fire of the sotnia in reserve pursued the enemy, who were now in full retreat.

The skirmish soon came to an end and we were ordered to halt till 2 P.M.

The pace of the transport was again very slow, the animals straggling and often coming to a halt.

The transport again.

Units were accordingly once more ordered to take over one day's food and forage. This lightened the transport but burdened the troop horse. As the transport officers made no attempt to quicken the pace of the pack animals, a cavalry officer was appointed Chief Transport Officer and a sotnia of Cossacks was placed at his disposal. Movement near the rivers was fraught with more than ordinary difficulty. The ground there is enclosed by high banks to protect it from floods. The difficulty of getting the loads through them continually delayed movement. Still worse they often slipped and then horses and mules kicked till they had cast their loads.

The column moved on at 2 P.M.

About 4 P.M. a report came in that the village of Utziatni was

Affair at Utziatni—
(see Sketch 3).

occupied by a company of Japanese infantry and half a squadron of cavalry. The village is a large one. On a slight rise to the left of it and some hundreds of paces distant, there were two houses, surrounded by a high mud wall. We learnt afterwards that this was a native liquor factory and that it was exceptionally strongly built.

Our patrol was met by volleys, so scattered and dismounted.

Shock tactics.

At the same time the Mounted Infantry occupied the high village wall and opened a murderous fire on the Japanese flank. This was so effective that

the leader of the detachment advanced his firing line to some Chinese tombs nearer the enemy. When the leading sotnia of the advanced guard charged, the Japanese retired at a run and occupied the mud wall of the liquor factory; then allowed the sotnia to get quite close before opening fire. As our men could not jump the wall, they suffered heavy loss and retired on Utziatni.

Meanwhile the second sotnia of the Verkneudinsky Regiment was ordered to attack the liquor factory on horseback, the fifth sotnia attacked further to the right but came upon the wall which the horses could not jump.

The second sotnia advanced to the attack in extended order across burnt kaulaing fields. I galloped up to the wall but failed to take it, and falling into disorder took cover behind a projection some 20 to 30 paces off. It was here that Bertin was killed. Bertin

Bertin's death.

was a French cavalry officer, who had obtained three years' leave and had joined the Russian army in Manchuria in the middle of December 1904.

He was galloping on the right flank of his sotnia and, when 40 to 50 yards from the wall, reared in his saddle, fell forward and was dragged along the ground. His left foot stuck in the stirrup and the horse dragged him almost up to the wall. There his foot freed itself and he remained lying. It is impossible to say whether he was then killed or was shot later: it is said that he raised himself once on his hands and then fell face downwards. When his body was recovered after the skirmish, he was quite dead: he had two bullets through his legs, a third in his chest and a fourth had struck his chin. The Cossacks tried more than once to rescue him, but the Japanese fire was so deadly that the attempt had to be abandoned after much loss.

The sotnia was forced to retire. Their retirement was followed by that of the Mounted Infantry. The dead and wounded remained under the wall and the Japanese opened fire on them for want of a better target.

It now became necessary to take the village to save the wounded. This was impossible with the troops in

Delay owing to advanced guard being without guns.

the advanced guard, which included no artillery, so the Colonel in command sent back to the main body to beg General Abramoff for guns and support.

Meanwhile, in obedience to General Mischenko's orders, the column continued its march on the village of Tamatava, where it had been ordered to bivouac. Its head, with which General Abramoff was, was already filing into the village, so General Baumgarten (in command of the main body) ordered me to go to the support of the advanced guard. The order was however countermanded and the Q-F. Battery and Dragoons were sent for from General Samsonoff's column to take the village.

By the time they arrived, it had got quite dark and so the fire of the guns was ineffective. The enclosure was only taken and the

Japanese detachment cut to pieces when the gathering darkness enabled our men to set the houses on fire.

The transport still caused delay and the commander of the force for the third time endeavoured to lighten it by the issue of supplies to the troops. In addition to this the Red Cross Detachment was ordered to strengthen its teams by mules and horses from the captured wagons. This compulsory method of using up the supplies and forage of the transport was unsound. I saw Cossacks with my own eyes take their rations and throw them away when they had gone a few yards.

I have mentioned above that I had been ordered on the evening of the 8th January to pick a detachment for a raid on the railway. Other regiments detailed similar detachments. These were formed into composite sotnias and attached to General Telesheff's column.

Immediately after the skirmish at Kaliho on the 9th this force was organised in three patrols and despatched to carry out demolitions on the railway. Two patrols were detailed to destroy the bridges north and south of Haicheng and a third was despatched to Tashichau for a similar purpose. The night favoured concealment of movement. It froze hard and a white mist hung over the ground. All the Chinese had hidden themselves in their houses.

The patrol, to which my regiment furnished its quota, consisted of 50 of my men and 50 of the Verkneudinsky Cossacks.

Between 4 and 5 o'clock on the evening of January 10th, it crossed the Taitse Ho and moved off in a south-easterly direction. The march was carried out at a trot and walk. Complete silence was ordered, smoking was forbidden and villages along the route were avoided. Guides were taken as required without the previous warning from the end houses of the smaller villages. From these it was ascertained that the Haicheng bridge (243 yards in length) was guarded by two companies of Japanese infantry with guns, but that, on the bridge situated some three miles north of Haicheng, which was 93 yards in length, there was a guard of only 12 men.

The patrol thereupon turned sharp east, got into preparatory formation and, about 2 A.M., struck the railway line.

Small patrols were sent out to the east and also south to Haicheng. On the chance that the attempt to demolish the bridge should prove a failure, an automatic bomb was laid on the rails at the level crossing. A half sotnia was then fallen in for the attack on the bridge, which was 600 yards off to the north.

At this moment the noise of a train was heard approaching from the north. The train itself was not visible, owing to a turn in the track and the lie of the ground. When it appeared, it was too late to remove the bomb and the patrol withdrew.

Perhaps the engine driver saw the patrol, perhaps not; the fact remains that immediately before the explosion, the engine emitted a succession of alarm whistles. A reply sounded from Haicheng.

In all the villages near signal fires burst out and alarm drums were beaten.

The explosion took place under the furnace of the leading engine. Probably however it was less seriously damaged than the second for it moved on slowly to Haicheng, whistling as it went. The patrol galloped about 600 yards and then drew up. Only half the officers and men assembled, and the commander who had the maps and orders was not to be seen. A party was sent out to search for him, but returned unsuccessful. Meanwhile alarm increased in Haicheng and the neighbourhood, and in the opinion of those who took part in the raid, it became impossible to blow up the bridge. It only remained to retire.

The patrol moved due west, marching by the stars and making a circuit round villages met on the road. They reached Newchwang in the morning, but turned off to the north as they found it occupied by Japanese. The horses were tired out, the men were dead beat and the country was alive with Chinchuses, so it was decided to halt in a small isolated house. At that very moment the scouts of General Samsonoff's column came into sight.

On the road a small Japanese reconnoitring patrol, under an officer, was met and cut to pieces.

The other half of the patrol rejoined the column at 11 o'clock at Newchwang.

Of the three raiding parties sent out, only one failed in its allotted task and it was sent out once more on its return.*

Orders were received in the evening for the following day.

Central Column Orders by General Abramoff

TAMITAVA :

10th January 1905.

From information from native sources, it is estimated that there are about 300 Japanese in Newchwang; 4,000 in Haicheng and 200 in Yinkow. Small bands of Chinchuses, led by Japanese, were met to-day and a company of Japanese infantry in the interval between the centre and right columns.

To-morrow, the 29th December, the force will continue its march on Newchwang.

* Of the other parties, what tasks they were allotted and how they carried them out the author says nothing. It is evident however that the patrol whose adventures he relates, was considered successful. Yet the damage it caused cannot have interrupted communication for more than an hour or two. The party scattered in a wild gallop at the approach of a train which was moving south and might be reasonably presumed to be empty or full of invalids from the front. Still worse was to come. The mine of the explosion, of the whistling of the engine and of the alarms in the villages seem to have thoroughly shaken the nerves of the 50 men who rallied 600 yards from the line. It was decided that it was "impossible" to attack the twelve Japanese at the bridge and that nothing remained but to retire. This is surely an instance hard to beat of the carrying of manœuvre play into the realities of war !

As regards the column under my command—

1. Advanced guard (1st Chitinsky Cossack Regiment and one company of Mounted Infantry under Colonel Sveshnikoff) to march at 7 A.M. by the shortest road on Newchwang.
2. Main body* to leave the starting point, which has been fixed on the south of the village, at 7-15 A.M. and to follow the advanced guard.
3. The rear guard * * * * * to march 600 yards in rear of the main body.
4. The right and left columns will march at a distance from the centre column of approximately $1\frac{1}{2}$ miles.
5. Officers will be detailed from regiments as yesterday to maintain communication and to be at the disposition of the G. O. C. the force.
6. The main body will detail both flank patrols.
7. Before leaving the starting point, the 1st Chitinsky Regiment will send forward one sotnia to examine and improve the crossing over the river Taitse Ho. On completion of this duty the squadron will rejoin the regiment.
8. The 1st Verkneudinsky Cossack Regiment will send a reconnoitring patrol in the direction of Newchwang to clear the front.
9. I will march at the head of the column.
10. The 5th Ural Cossack Regiment will detail one sotnia as escort to the pack transport. The duty of this squadron will be to prevent straggling and falling out.
11. The advanced guard will conform its movement to that of the main body, keeping touch by connecting files. Fighting ranks will march six abreast and transport four abreast.
12. Units will draw to-day their forage for this evening and to-morrow morning.
13. Each regiment will detail one officer and one orderly to be at the disposition of the commander of the column.
14. The main body will be drawn up in preparatory formation by 7 A.M.

(Sd.) GENERAL ABRAMOFF.

**Instructions from G.O.C.
the force, 10th January 1905.**

At the same time, we received the following instructions:—

1. It is particularly requested that my orders may be carried out at once. The failure to do so to-day occasioned delay and prevented the completion of the proposed march.
2. At night, in addition to the posting of outposts as required by the Training Manual and Orders, an infantry piquet must be told off in each occupied village.

* The regiments are detailed by name.

3. Before marching each column will select supplies from those carried by the pack transport. These will be consumed as required and the empty mules will be sent to the centre column.
4. All losses are to be reported. Wounded will be handed over to the Ambulance Detachment to-day. This will be near the Headquarters Staff, while the force is halted, and during the march in the centre column.
5. The ambulance teams will be supplemented by pack mules and animals from the captured carts.
6. Reconnoitring patrols, especially those on the flanks, are not to let themselves to be drawn into skirmishes with the enemy, but will confine themselves to simple reconnaissance and report.
7. The march will commence at 8 A.M. to-morrow.
8. Before marching the dead will be buried with military honours.
9. The trumpeters of the 1st Chitinsky Cossack Regiment will parade to-morrow at 7 A.M. at Force Headquarters to take part in the burial ceremony.

(Sd.) GENERAL MISCHENKO.

At 12 midnight we received the following:—

Frontal attacks are to be avoided as much as possible, especially frontal attacks by mounted troops on an enemy occupying walls or villages.

On such occasions, it is desirable to surround the village in extended order, keeping out of range of aimed rifle fire and threatening the enemy's line of retreat. If he continues to offer resistance, the village must be shelled with one or two sections of artillery, and for this purpose the common shell must be saved. An enemy on foot, in open country, must be attacked in extended order.

(Sd.) GENERAL MISCHENKO.

The transport had not been long in showing itself in its true colours. Not to lay stress on the fact that many horses and mules were unladen, their loads having been thrown yesterday and to-day, on the very first occasion of meeting the enemy, our fighting line was weakened by the necessity of detaching a whole regiment as transport guard.

Our protest that we had all we required was overruled and we had to take extra forage in order to lighten the pack animals and increase their mobility. As I have already said, I saw with my own eyes, how Cossacks went off a few steps with their issue of forage and threw it away. However the object was to get more animals for the ambulance detachment and this was attained.

On the 15th as on the 9th the late arrival in camp and darkness were the cause of faults in the outposts. I have already stated that the outposts of each column used to grope in the dark for those of the next and used

Outposts.

Comments. The transport.

only to get touch in the morning. Such was the case on the 10th, when, in one place, there was a huge gap and in another they were standing in two lines back to back. This I reported.

A few words as to the fight at Utziatni. If I do not err the reconnoitring patrols, sent out in front of the advanced guard, took part in the preliminary skirmish with Chinchuses on the Hun Ho and did not continue to move forward. Having once discovered the presence of the enemy and his strength, having sent in their report or, if necessary, taking advantage of their proximity, having made their report personally to the commanders of the advanced guard, reconnoitring patrols should move on, avoiding collision with the enemy and leaving the duty of fighting to the advanced guard. If they had done this, our patrols would have secured our right flank and the presence of Japanese infantry in Utziatni would have been reported sooner.

If we had received this information sooner, we should not have wasted time after the first fight—we should not have halted for $1\frac{1}{2}$ hours at a distance of only a few miles from Utziatni. We should have come up sooner, cleared up the situation, and sent for guns in good time. Most important of all, there would have been no unnecessary, long-drawn-out fight and hence no heavy unnecessary loss.

It was unsound, as General Mischenko reminded us in his orders, to attempt a frontal attack mounted upon a mud wall, 7 feet high. Three attacks, viz., the attacks of the advanced guard sotnia, of the second sotnia and of the fifth rolled back unsuccessful from this wall. The sotnias suffered heavy, absolutely unnecessary, loss and we had to take the place at all costs to save the wounded left lying under the wall.

It seems that previous to the occupation of the liquor factory by the Japanese, the village was occupied by our patrols and even a sotnia. It was a mistake to evacuate it. On the contrary, they should have manned the factory as well, and so they would have been in a position to open fire almost in rear of the Japanese. The least they should have done would have been to save the commander of the advanced guard from the folly of delivering a cavalry attack on a seven foot mud wall.

As things actually were, granting the advanced guard commander's ignorance of the existence of the wall, it remains to point out yet another error—the attack was carried out without ground scouts.

Such is the very object for which ground scouts exist. Their duty is to gallop in front and on the flanks to protect the attacking unit from sudden surprises and warn it of impassable obstacles.

It is preferable to lose a few ground scouts than for sotnias launched against a seven foot wall to retire twice under the fire of an enemy a few yards distant, and to suffer huge losses without effecting anything, simply owing to the want of foresight of one individual*

* We, at all events, can throw no stones here. Compare the Cavalry charge at Omdurman, Sanna's Fort and a recent Manœuvre fiasco at home.

Speaking generally, it must be allowed that in this matter we are as unsound in peace as in war. The peace training, not only of a squadron, but even of the larger cavalry commands, should never be carried out without the use of ground scouts, whose duty it would be to report existence of impassable obstacles.

Training too should be carried out less on the barrack square and more on intersected terrain. Believe me that when this becomes the rule and when the use of scouts ceases to be neglected, the scouts themselves will understand the importance of their rôle, and we shall cease to hear of the wasting of sotnias in the attack of impassable obstacles.

There remains the question—Why did we fight at all at Kaliho and Utziatni? It brought us no advantage. Further it caused useless loss of time and attracted attention to our march in an absolutely unjustifiable manner. Could we have avoided fighting and pressed on without loss of time to our final objective?

It seems to me that the mistake lay in our flying patrols moving almost always immediately in front of our advanced guard. We hardly ever knew what was going on 6 or 7 miles in front. In such conditions the reports sent in by the patrols did not effect their object, as when they arrived it was too late for the column to avoid collision with the enemy.

To finish the analysis of the fight at Utziatni it only remains to add that, if the commander of the centre column had been in his place, in other words, if he had been with the leading regiment of the main body when the first shot was fired and had remained there all the time, he would have seen and, of course, diagonalised the situation, and then artillery would have been called up in time—before the second frontal attack.

Then General Baumgarten would not have been kept till dark discussing the situation at a distance with a column leader who quite wrongly was already in camp.

11th January 1905.

Early morning; gloomy and cold; a penetrating fog.

The third day, 11th January 1905.

Just before marching we buried Bertin and the other dead. The officers, with General Mischenko at their head, collected round the grave. The priest read the prayers and blessed the hero's grave. The trumpeters blew some bars but were ordered to stop, lest they should reveal our presence to the enemy.*

The force moved on.

* Sic. Yet 12 hours' before they had fought a long skirmish two thousand yards from this spot. The Japanese were not credited with any great intelligence as scouts!

My regiment was detailed for advanced guard. All morning I had vainly sought for guides. The village

Guides.

was as if dead. No matter where my Cossacks went, they found empty houses and only things hurriedly thrown down pointed to the fact that it had been lately abandoned.

Then I went to the Staff, and in response to my request, they gave me 6 men from the 40th Sotnia of Frontier Guards.

* * * *

* There was some confusion in starting, owing to the column being mixed up in the bivouac. The author conforming, as he says, to the movement of the left column moved down the right bank of the Taitse Ho. The centre column crossed the river and moved down the left bank. The

Result of vague orders. Difference of opinion as to "the shortest way to Newchwang."

left column then moved to its left and the centre column was left without an advanced guard till Colonel Sveshnikoff's regiment had been recalled by orderlies across the river to its proper position.

When the regiment had gone $7\frac{1}{2}$ miles, Colonel Sveshnikoff received an order from General Mischenko to move his regiment forward at a trot and carry out a strong reconnaissance of the town of Newchwang, which was reported to be

A strong reconnaissance. Newchwang—(see Sketch 4.)

occupied by Japanese and Chinchuses.

He says:—I trotted forward, my 1st sotnia still in front. In addition, I sent a patrol on either side of the town to cut the telegraph and telephone wires.

Before reaching the town, I received a report that the left patrol had succeeded in destroying the telegraph and telephone, but that its leader 2nd-Lieutenant Mungaloff had been wounded in the leg in two places, that two Cossacks had been wounded and three horses killed. From the 1st sotnia came the sound of firing. I ordered the regiment to dismount and awaited further information.

Poor Mungaloff was soon afterwards carried past on a stretcher. He was in agony as both wounds were from copper bullets, but in spite of his suffering, he handed me in triumph pieces of the wires of the damaged telegraph and telephone.

He was bandaged up and sent back to the centre column.

Newchwang is a large commercial town. On the north east side of the town lies a suburb separated from it by a tributary (then dry) of the Haicheng river. In the town itself all buildings are of brick. In the suburb some are wooden.

When the 1st sotnia came in sight, the Japanese occupied the suburb. They fired a few volleys at the sotnia and occupied the stone buildings on its northern edge, which had been prepared for defence.

At the commencement of the reconnaissance the right patrol had been fired on from the wood north-west of the town and it now

* Here and at one or two places the original has been summarised to save space.

began to fall back. I accordingly reinforced it and finally sent the 3rd sotnia out. Thereupon the Japanese retreated from the wood to the town and the 3rd sotnia, after detaching a small patrol to watch the right, rejoined the regiment.

Owing to the advance of the left column, the Japanese also evacuated the wood north-east of the town.

My patrol and the leading troops of the left column made a circuit and appeared in the enemy's rear.

Meanwhile my 1st sotnia had occupied the suburb and was firing on the town. I received an order from General Abramoff: "The column has come to a temporary halt and is drawn up in preparatory formation. Continue your reconnaissance."

Acting on this order and urged on by the rising volume of fire which was now audible from the 1st sotnia, I sent my 3rd sotnia forward to reinforce the 1st and followed it with the remainder of the regiment. The Japanese abandoned the perimeter of the town, but remained in occupation of temples and houses along the streets.

To take the town now without artillery was not to be thought of. I told General Baumgarten my opinion and he passed it on to General Abramoff. The latter agreed and promised to send me two guns, on condition that I would open fire immediately. This was impossible, without first calling off my men and the Cossacks of the left column. I was then ordered to retire and follow after the centre column, which was passing the town on the west. I had only just withdrawn the regiment, when Captain M —, an orderly officer of General Mischenko's, galloped up and gave me a verbal order from the General to lead my regiment through the main street of the town, which he thought had been evacuated by the Japanese owing to the fire having ceased when I withdrew my regiment. In spite of my protest that a large number of Japanese and Chinchuses were still in the houses, the orderly officer informed me that he had given me the order exactly word for word. I was forced to obey and entered the main street with the 3rd sotnia leading. Immediately the regiment entered the town, fire was opened on it from the houses. The 3rd squadron passed along the street at a trot, regardless of loss and dismounting at the bridge opened fire. With the remainder of the regiment I turned off and made my way by winding streets to the south edge of the town. Thanks to the very effective volleys of the 3rd squadron along the streets the Japanese were unable to come out of the houses and so the regiment succeeded in passing through the town without serious loss.

It was quite dark when I assembled the regiment. The columns had already passed and only the transport escorted by one sotnia of the 5th Ural Cossack Regiment was still wending its way along the eastern side of the town.

As I came out on the open the Chief Transport Officer rode up to me with a request for protection. At the same moment I received the order:—"Escort transport, bivouac." It was not however stated where the bivouac was to be.

I captured a Chinaman and made him lead the regiment to the high road. That once reached, I turned south. We soon saw fires, and marching on them came upon the bivouac of General Samsonoff's column, whence we made our way to the centre column. I handed over my wounded and rode to Head-quarters.

According to Chinese evidence, there were about 250 Japanese in Newchwang, but Chinchuses and Chinese soldiers also took part in the fight with us.

Some Japanese who fled south were pursued by the 5th Ural Cossack Regiment. Of these, two were cut to pieces, one shot himself rather than surrender and five were taken prisoners.

We received orders in the evening :—

DINZIATIN :

11th January 1905.

Some of the Japanese met with at Newchwang have retreated on Yinkow and some have hidden in villages. The Chinese report that reinforcements have lately arrived at Yinkow.

Orders for 12th January 1905.

The force will continue its march on Yinkow.

1. The column of General Telesheff will march to-morrow at 8-30 A.M. by (certain villages) on Handziafudzi, where the midday halt will be.

2. Column of General Abramoff :—

(a) Advanced guard consisting of 5 sotnias, 2 companies Mounted Infantry and two guns* under General Baumgarten will march from the bivouac to-morrow, 12th, at 8-30 A.M. by (villages) on Takaunchen where the midday halt will be. Special instructions will be issued later as to place of bivouac.

(b) Main body (13 sotnias, 2 companies of Mounted Infantry and 4 guns) under my personal command will march at 8-45 A.M.

(c) Rear guard (4 sotnias) under Colonel Sveshnikoff will march conforming to pace of the transport (with the main body).

3. Column of General Samsonoff will march at 8-30 A.M. on Houhanhen, where the midday halt will be.

4. Artillery will be used to silence rifle fire from villages. Special attention is to be paid to scouting on front and flanks.

5. For the purpose of maintaining communication one Officer and six Cossacks will be detailed from the 1st Chitinsky Cossack Regiment to report to General Samsonoff and from the 4th Ural Cossack Regiment to report to General Telesheff. Officers are to report themselves to the commanders of columns and remain constantly close to them, so that there may be no repetition of the complaint that officers have latterly not been sent to keep up communication.

* This is the first occasion on which guns are sent with the advanced guards.

The 1st Verkneudinsky Cossack Regiment will detail an officer and two non-commissioned officers to be at the disposal of the Commander of the Force.

6. General Baumgarten is responsible for measures of protection in the advanced guard. Lieutenant-Colonel Pevsky is placed at his disposal.

7. The 4th Ural Cossack Regiment, leading regiment in main body, will detail advanced and flank guards to march 300 yards in front and 600 yards to the flanks.

All regiments will send out ground scouts. Connection with the advanced guard will be maintained by connecting files dropped by it.

8. Lieutenant B. will superintend the march of the transport. A sotnia of the 5th Ural Regiment is placed at his disposal.

9. Starting point—Southern edge of the village.

10. The advanced guard will send out Officers' patrols till touch is obtained with the enemy.

11. I will be at the head of the column.

(Sd.) GENERAL ABRAMOFF.

AFTER ORDERS.

11th January 1905, 9 p.m.

1. It is the duty of the commander of the advanced guard told off for the following day to carry out a preparatory reconnaissance of the first part of the road by which the force is to march and, if necessary, to detail a detachment to repair it.

2. (Relating to guarding of Japanese prisoners.)

3. (Ordering the destruction of such captured supplies as are not required by units.)

4. Orderlies are to be sent to the commander of the force before the hour of marching.

5. Before arrival in bivouac all units will send their billeting parties forward to head of the column.

6. It is to be borne in mind that provided units' order of march be not altered by the necessities of combat, outposts for the front will be detailed from the advanced guard and for the rear from the rear guard.*

Comments on the work of January 11th.

It seems to me that on the 11th January we made the same mistake as on the 10th.

What necessity was there to take Newchwang? If its capture

Secondary objectives.

was part of the plan of the Headquarters Staff, they ought to have acted more energetically and sent me guns when I first asked for them. They were

* These orders, as in many cases the orders issued during the raid, are clear proof of lax discipline in the force and of pathetic endeavour to inculcate at the twelfth hour the simple lessons of war. Jesaul Engelhard in a lecture delivered at St. Petersburg and quoted in the "Militar Wochenblatt" No. 79, admitted that the second levy of the Cossacks had been very indifferently trained. The Trans-Baikal men were excellent material, but quite ignorant of reconnaissance work and the duties of patrols.

quite aware that I would be helpless if opposed to a comparatively small force in a large town prepared for defence. General Abramoff in his orders of 11th January (para. 4) goes so far as to order us to reply by gun fire to rifle fire from villages. In spite of this, that very morning he was bargaining with me as to whether he should give me artillery or not, finally giving his decision in favour of the sending of guns, but only with the impossible condition that I should open fire at once, without giving me time to even recall my Cossacks. We had the usual waste of time, followed by mad and quite unnecessary haste. The decision of the commander of the force to abandon Newchwang and continue his march, in spite of the fact that Japanese still remained in the town, proves in itself that its capture was unnecessary. In the meantime, we lost several hours by turning aside from our main objective in the pursuit of unnecessary objects of secondary importance. If the object of our attack on Newchwang was simply reconnaissance, there was no need to persist with such obstinacy.

If we had not lost time in fighting, if we had not made a long halt on the following day, if our rate of march had been quicker, we should have arrived at Yinkow a whole day earlier, and possibly the Japanese would not have had time to throw some train loads of infantry into the town.

Delays.

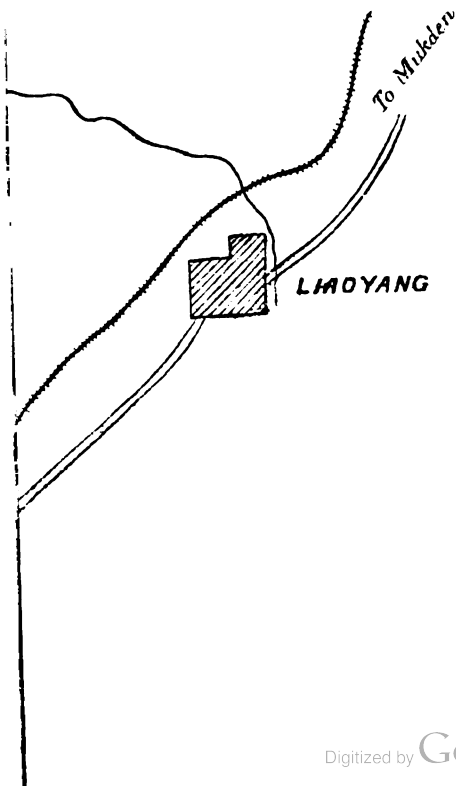
(To be continued.)

3A. *first day's march.*

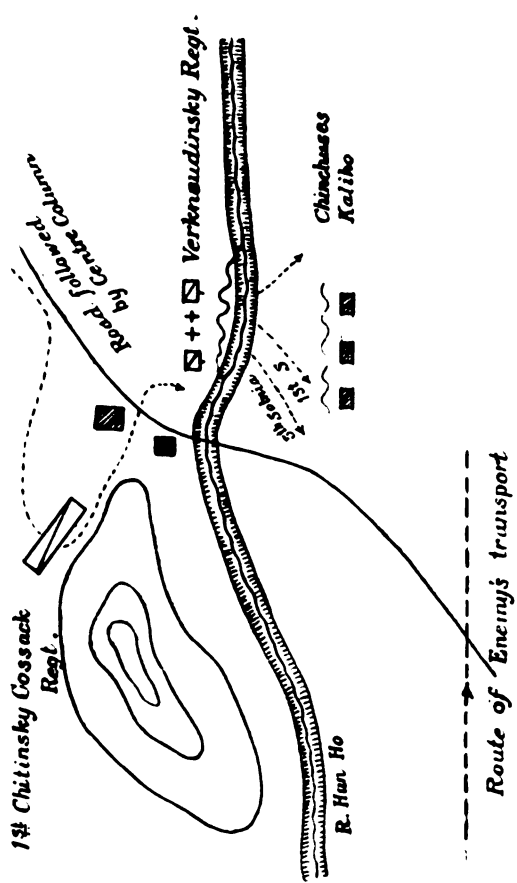
Japanese on River Hun Ho

*Line up to which
Japanese patrols went* } *dotted N.O.P.Q.*

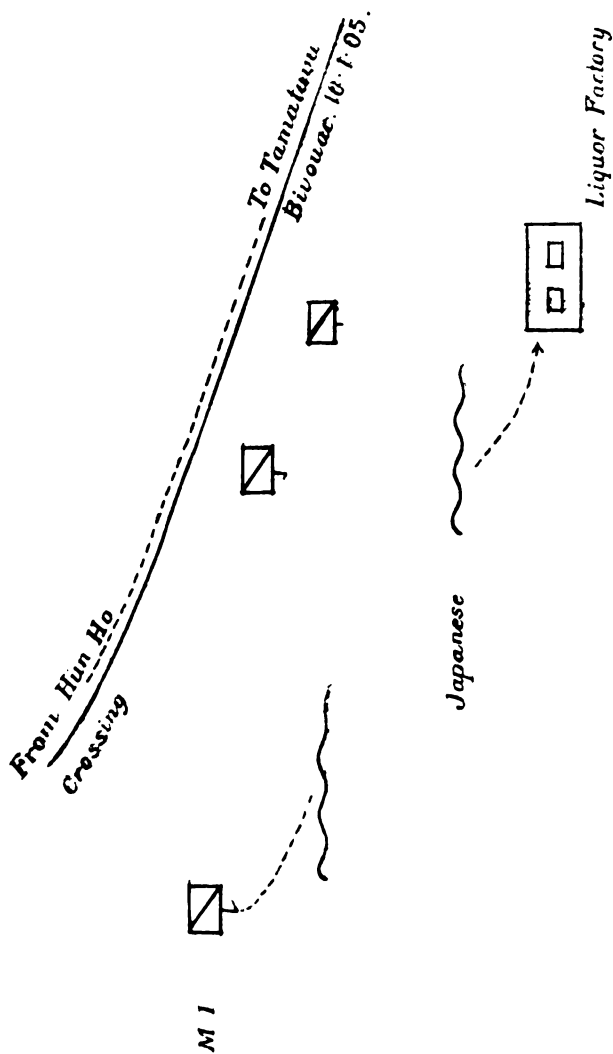
▣ *Sandepeu*



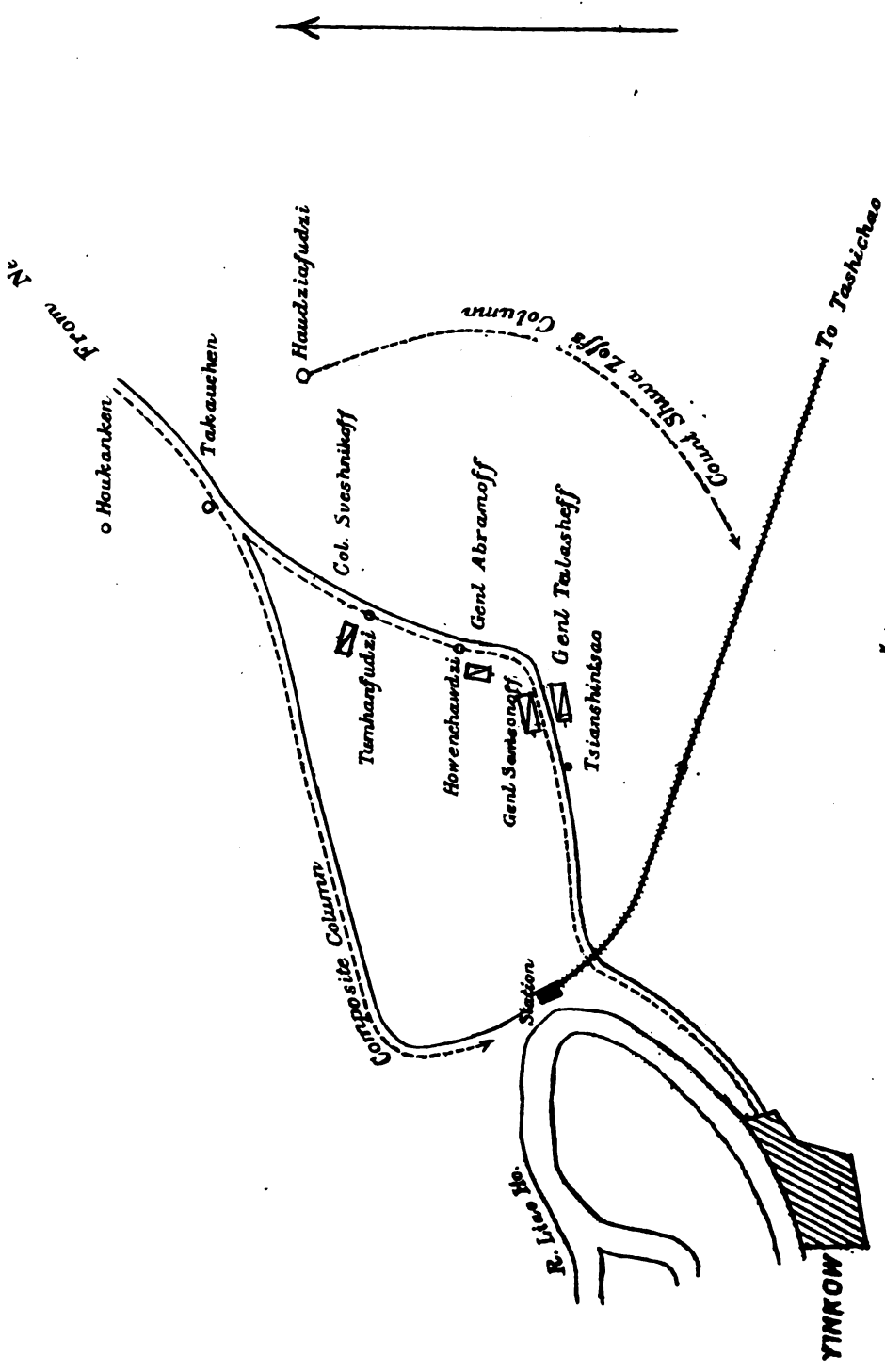
SKETCH No. 2.— Crossing of the Hun Ho.



SKETCH No. 3.—Skirmish at Utsiantui



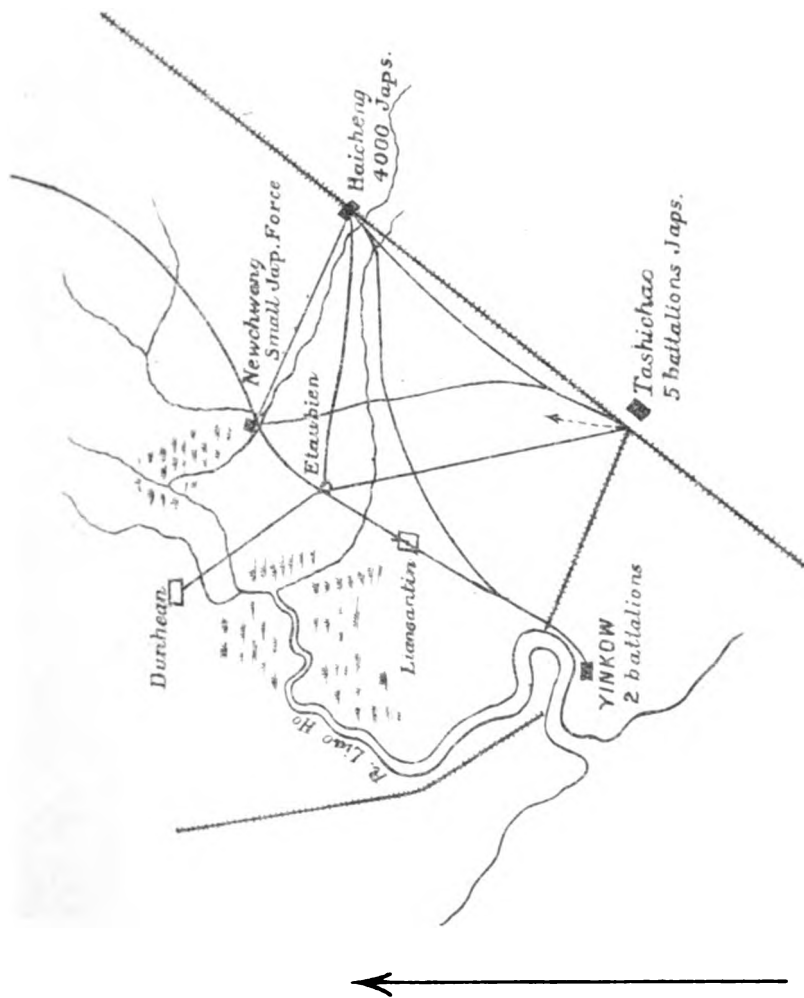




Scale about 4000" to 1 inch.



SKETCH No. 6:—Showing position on morning of 13th January.

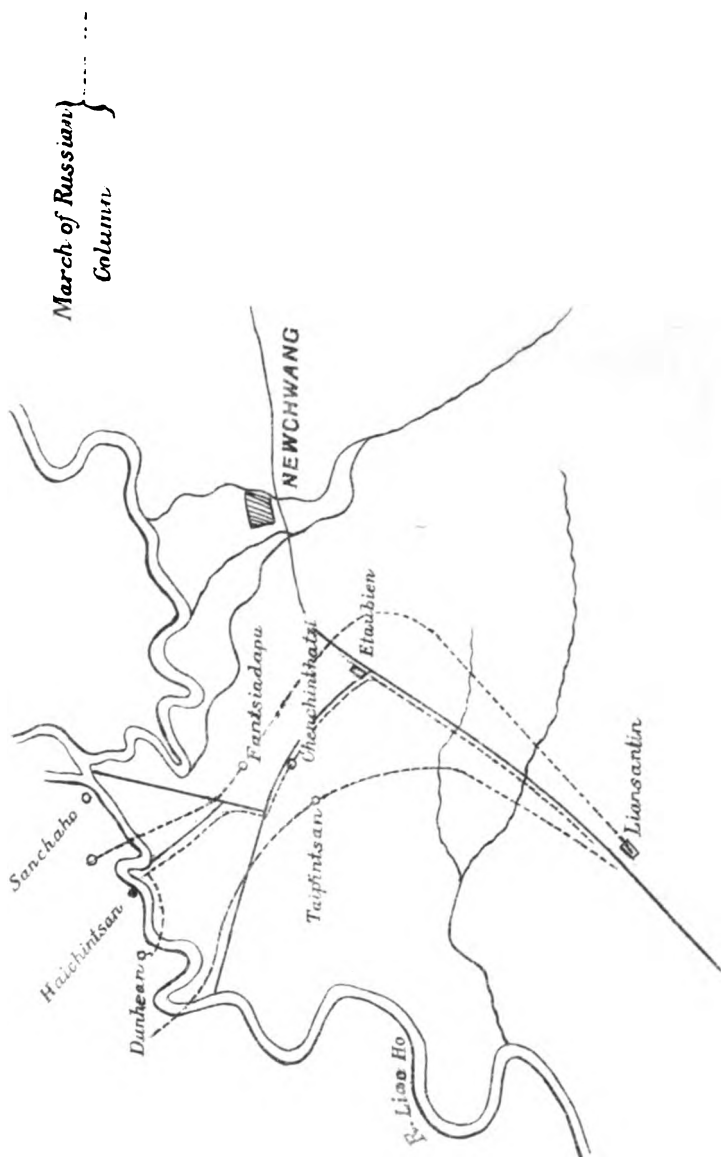


Japanese ...	...	14 $\frac{2}{3}$ miles
Russians ...	..	15 $\frac{1}{2}$ do.
	..	7 $\frac{1}{2}$ do.

Haicheng to Elaubien
Tashichao to do.
Newchwang to do.

Scale about 12 miles to 1 inch.



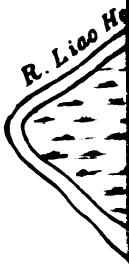


Scale about 5 miles to 1 inch.

05.

 LAIOYANG

Columns in advance :-
Right and Left _____
Centre -----
Columns in Retreat -----

R. Liao Ho


8 12

$\frac{1}{4}$ miles.

PRECIS OF FOREIGN MILITARY PAPERS.

GERMAN PAPERS.

Militär Wochenblatt.

In the number of May 4th, there is an article entitled "The New Swedish Plan of National Defence", which is worth looking into, in view of all the discussion that is going on about our own requirements at the present day.

The Swedish Plan has been evolved by the Chief of the General Staff of the Army conjointly with the Chief of the Naval Staff, subsequent to the separation from Norway.

1. *The Army.*—The 77 Battalions of Infantry are to be increased by 24 during the period 1908-1913, and it is recommended that the 2 Fortress Infantry Regiments should be increased from 2 to 3 Battalions each, that is, to the strength of ordinary Infantry Regiments. The Field Telegraph Troops are to be increased, and the General Staff to be extended.

On mobilisation it is intended to raise 4th Battalions, and with this end in view the nucleus of officers provided in peace by, 1 Major, 4 Captains, and 1 Subaltern extra to the establishment of each Infantry Regiment.

Balloon and Searchlight Services are also to be started.

In order to obtain the above-mentioned increases, the following alterations are proposed in the terms of liability to service:—

1. The extension of liability in the first category (The Line) from 8 to about 10½ years.
2. A corresponding extension in the Second Category (The Reserve) from the 11th to the 14th year, in place of from the 9th to the 12th as at present.
3. Liability to serve in the "*Landsturm*" extended up to 43 years of age instead of 40 as at present.
4. Improvement in the training of conscripts by lengthening the time of training of the Infantry, Artillery of Position, and Fortress Artillery, from 8 to 12 months, of which 9 months would be with the Colours and 3 periods of repetition of 1 month each in the 2nd, 3rd and 4th years of service, except in the case of the Artillery of Position, who are to have a training of two periods of 45 days each in their 2nd and 3rd years of service, by which these troops will then be on an equality with the Cavalry, Field Artillery, and Field Engineers.
5. Easier conditions for the entry of Volunteers.
6. Free control of the Government over the "*Landsturm*".

As regards this latter point, at present the "*Landsturm*" can only be called out when the First Category is with the Colours, and the Reichstag is sitting.

The anticipated expenditure for the Army for the period 1908-1913 is 60 million crowns.

The above proposals for strengthening the Army are considered to be the minimum possible.

2 *The Fleet*.—The increase proposed in the fleet, also to be carried out during the years 1908-1913, is the addition of:—

- 2 1st class battleships,
- 2 3rd class Battleships,
- 2 Cruisers, with torpedo tubes,
- 8 Torpedo boat destroyers,
- 12 Torpedo boats,
- 8 Submarines,

With corresponding increase of *personnel*.

The Naval Staff consider that really double the above requirements are necessary, but have limited the increase to the numbers given, as they do not think that more can be obtained in the course of 6 years.

Other proposals are for the extension of the naval harbour at Stockholm, the establishment of a similar one at Göteborg, as well as the carrying out of various improvements in canals and fortifications.

The aim and object of the above are that Sweden should have a strong field army and fleet to protect her commerce, and her frontiers.

In the numbers of May 9th and 11th appears an article under the heading "Cavalry Dismounted Action." Whether it will be possible, says the writer, after arming our men with a weapon equal to the infantry rifle, to make them into just as good infantry as cavalry soldiers (not marksmen, for there is already scarcely any difference) must be doubted. If it is represented to us that it is for this very reason that we keep our men for three years, the writer says he feels sure that every expert will agree with him that it is much more difficult to make a good rider in two years (for by the third year he must be thoroughly trained, that is, he must be able to ride raw horses) than to train a good infantry soldier in the same period. With this, however, our work is not nearly finished, for, besides instruction in riding and attention to matters of detail, which are included in our training just the same as they are in that of the infantry, we have also to instruct our men to make the most efficient use of their lance.

A cavalryman will certainly never regard his horse as a mere means of transport, for in this case he would turn himself into a mounted infantry man, and, says the writer, after the bitter experiences which the English suffered in the Boer War, no sensible man still gives a thought to mounted infantry, and therefore the first principle with our splendid arm must and always will be: "The cavalry must in the first instance be able to ride." This cannot be laid stress on too frequently.

The relation between riding and shooting is then discussed as follows: "The horse is the means of transport for rapidly approaching

the enemy; rifle fire actually clears up the situation. This is in any case only preliminary, and will always be the exception. If the enemy should be shaken, then a charge will always be easier and certainly more effective; if he is not shaken, then we shall very rarely inflict serious loss on him by dismounted action. In this quite a number of factors must be considered, for which a knowledge of detail is certainly necessary. We must dismount under cover and place our horses in safety. Again, we can, at all events during the attack, only use half our fighting strength, for the horses will have to be led up if the attack succeeds. Even now, in order to attack on foot, a disproportionate number of cavalry are necessary against a relatively small and intact infantry detachment, and every leader will have to consider deeply whether this is worth while, and if the arm, to quote an often misused term, is not too valuable, for it must be clear that in an attack on a large scale the arm will be withdrawn for a long time from its proper sphere of work, and the hand led horses will be a remarkably easy object of attack by an energetic and active hostile cavalry; the small cavalry will not be able to prevent this, or are we again to be protected by our infantry?"

It certainly sounds very well, when it is said that we ought to be able to fight just as well on foot as when mounted, but the way to ensure this has not yet been discovered and is not likely to be.

Certainly cases may and will occur when we shall have to leave our horses several miles behind, without any prospect of seeing them again, until the enemy has been either driven off or defeated.

In that case the situation is quite clear; we have been relieved of the care of our horses and the result, for us as well as for all brave infantry, is that we must conquer, or die. But these will be rare exceptions, for usually we shall have our horses with us, and in any case the cavalry leader will certainly be caused much anxiety by being in doubt as to whether he will be able to mount his men again or not and every man of the force will be filled with the same uneasiness. This is also easily explained.

The author considers he is not asserting too much when he says that our shooting results at over 900 yards at all objects, but especially at riflemen lying down, will not be very great. One must remember that in individual target practices, the man is only trained to fire up to the 450 yards range. The field firing, which takes place once a year, does not, however, make him sufficiently certain at longer distances. The new Musketry Regulations will now, of course, give more frequent opportunities for this to be carried out.

Infantry, in spite of all the trouble taken with our uniform and bandoliers, which are mostly white, will soon notice that cavalry is opposed to it, and will not be so obliging as to deploy, but will only send a relatively small portion against us in skirmishing order as is already now the case at manœuvres. In any case infantry will not be nearly so much disturbed by anything else as by a charge. Should the enemy attack, then when he has advanced to within 900 yards' range we may expect to inflict perceptible losses on him (he does not

even then think great results would be obtained by a skilful advance in short rushes), but we shall have to seriously think of mounting, if we do not wish to fall an easy defenceless prey to the enemy, in the most unpleasant situation that there can be for us, namely, when in the act of mounting. That our men will also not be able to aim steadily goes without saying.

Our Training Manual lays down for umpires, that at distances within 450 yards the decision on the fire combat is to be quickly given. In the Russo-Japanese War, however, cases often occurred, in which the opponents lay opposite one another for hours at these distances, and the attacker had at last to resort to the bayonet. The bayonet was generally used in every large battle and not only regiments but whole corps at the Sha Ho attacked with it. At Liao Yang, when on the morning of the 31st August the opposing lines of skirmishers were separated by distances of only 350 to 450 yards, and carried on the fire combat at this close range throughout the day, the Japanese were unable to drive the Russians out of their positions by means of fire action. At Mukden the opponents rained fire on each other for three whole days, without either side giving way.

From this it is clear, that it is scarcely likely that we shall be placed in a position obliging us to keep off the enemy by firing all day. For this we are neither provided with a spade nor trained to its use. Therefore, if we wish to attain anything, we shall have to carry out an assault without the aid of cold steel against an opponent who may be behind good cover and possibly entrenched. He believes that in this case the losses would be very different to those in a charge!

In dismounted action an important ally, which must not be under-rated, fails us, namely, the moral effect, which a well delivered charge will have on an enemy who may not even have been shaken. We already see at manœuvres what an impression the charge of even one squadron makes on the infantry. This impression will certainly not disappear in war, when large masses charge, and even if it may only have the effect of delaying or warding off the infantry it will under certain circumstances be of great gain. The reason why in 1870-71 not one single French charge succeeded, was because they were all badly led and carried out without energy; Kunz gives a very good explanation of this in his small pamphlet entitled "Attacks of French Cavalry on German Infantry and Artillery."

Again, it is extremely doubtful whether the Japanese cavalry brigade under Akijama, which by its timely intervention at the Battle of Wafangkao saved its sorely pressed wing by dismounted action and brought the fight to a standstill (not however by its carbine fire but by its machine guns) could not have done even better. Could it not have decided the battle, after a thorough preparation with machine guns, by delivering a charge in conjunction with the remaining divisional cavalry, which had also dismounted in order to fight on foot, but by doing so had got into great difficulties?

The author apparently means that we need not be afraid that the riding spirit will suffer by dismounted action. The great love of sport, which unfortunately only relatively few and mostly young officers cultivate, cannot counteract this. The Russian cavalry in the war of 1877-78 gives us an example. Colonel Baykoff, of the Russian General Staff, says among other things: "When cavalry met infantry, it either retired, or employed dismounted action. This kind of cavalry had completely lost its dash and had become bad mounted infantry, and why? Everything possible had been taught it except to close with the enemy."

Kuropatkin also in the last war said the following hard words about the Cossacks at the end of the first instructions issued by him: "And if the spirit of the Cossacks had been better, they must have attacked the enemy with cold steel!"

We fortunately need not be afraid that such an unworthy fate is in store for us.

The Emperor of Germany, last summer in his speech to the officers of ten cavalry regiments at the manœuvres near Münster, expressed himself in the most unambiguous manner that the day of cavalry is not past, and that even now charges delivered at the right time will have the greatest results during a battle and not only subsequent to one.

In a short article on the "Troops of the Bey of Tunis", (in the number of May 14th), the writer states that since 1881 they have been thoroughly reorganised by the French on the model of their own army, and number about 600; they consist of:—

One Battalion of Infantry,
One Battery of Artillery,
A detachment of Cavalry,
One Military Band.

The men are said to be obedient, well-disciplined, and capable of endurance.

The number of May 23rd contains a flattering notice of Sir Ian Hamilton's "A Staff Officer's Scrap Book," Volume 2.

"The Military Importance of Afghanistan" (May 25th) deserves a full *précis*. The writer, whose name is not disclosed, says that the welcome prepared for the Amir shows what great importance the English Government attached to his visit, and that Habibullah's appearance on Indian soil cleared up his relations with his two powerful neighbours, England and Russia, and was moreover a triumph for English diplomacy, which should not be underrated.

Habibullah, he continues, ascended the throne during the South African War, and had he then had leanings towards friendship with Russia, the early events of that campaign would no doubt have strengthened them. When the Russian arms suffered decisive defeats in the Far East, however, he showed his desire for a *rapprochement* with England.

The Amir, for some little time after his succession, did not bind himself to abide by the Treaty entered into by his father in the year

1880, and in the event of an Anglo-Russian conflict it was an open question as to which side Afghanistan would take. This attitude caused the Anglo-Indian Government many anxious moments.

Before many weeks of the visit had elapsed, states the writer, these fears were completely set at rest, as the Amir publicly announced his adherence to the obligations of his dead father, and his preference for England.

The writer then points out how Russia may threaten the independence of Afghanistan, for by Mr. Balfour's famous declaration in the House we are bound to regard any further advance of Russia as a *casus belli*.

The question as to how far the movements of a large army marching through Afghanistan would be influenced by the peculiar conditions of this country have been discussed over and over again by military writers. The following three factors would seem to be of importance :—

1. The mountainous conditions of the country.

2. The questions of the practicability as regards movement, and of the fertility of the country as also the questions of transport and supply closely bound up with these.

- 3 The power of resistance of the Afghan Army.

A description then follows of the mountain barriers of Afghanistan, and of the impracticability of the Pamirs. In the eastern portion of the Hindu Kush the writer considers the Durah Pass (12,800 feet) to be the only practicable one, and quotes Colonel Hanna as saying that not more than 300 men could cross it in one day, and that too for only three or four months in the year. The western Hindu Kush are easier, and here is situated the Bamian Pass (10,250 feet).

The writer then describes what he calls the "King's Way" (the main trade *route* from Central Asia to India), the road from Herat to Kandahar. Up to Girishk the country is barren, but here it becomes rich and fertile, and an army could count on living on the country. Throughout this road it is to be noted that there are no bridges.

Next to the geographical conditions the attitude of the Afghan troops towards an army would have a considerable influence. According to English and Russian sources of information the regular troops of the Amir number some 70,000 to 80,000 men, of which about 50,000 are infantry, 20,000 are cavalry, and 1,000 are artillery.

As universal conscription obtains in Afghanistan, in case of war all men capable of bearing arms would be summoned to the colours. But, as the tribes in Afghan-Turkistan and round Herat are friendly disposed towards Russia, and besides as a portion of the remaining tribes could not be relied upon to answer the Amir's summons, the full fighting strength cannot be reckoned at more than from 200,000 to 250,000 men.

These men cannot be compared with European troops, as they lack everything which makes an army formidable, as, for instance,

capable leaders, uniform organisation, good armament, equipment, and discipline. Every man wears just what he likes. The infantry round Kabul and on the frontier are certainly armed with Martini-Henry and Mauser rifles, but all the rest have only the oldest patterns, even flint-locks.

The artillery are said to have about 200 guns of different patterns. Among these are 30 Q. F. Krupps, which were introduced with the consent of the English Government in 1902.

The cavalry are only armed with the lance, and are badly mounted.

The army possesses no technical troops, or such things as supply columns, etc.

Still, though on account of all these defects the Afghan Army is not fit to stand in line with European troops, it is capable of doing considerable damage to the lines of communication of an army marching through the country, and of causing the latter to guard its communications strongly.

England, says the writer, is well aware of these shortcomings of the Afghan Army, and her dearest wish is to send to the country English officers to instruct the troops, and to be allowed to prepare the future theatre of war by the establishment of roads and railways and by means of a careful survey.

Not until these desires of England have been fulfilled can Afghanistan be regarded as a strong bulwark of India against Russian aggression.

In the number of June 15th there is a short article on the Military Forces of Canada. This has been transcribed from the *Journal of the Royal United Service Institution*, and no comments are added. That of June 29th contains a very full and precise list and description of all the manoeuvres to be held in the British Isles during the summer and autumn of 1907.

These articles together with that on the "Military Importance of Afghanistan" show how great an interest our Teutonic neighbour takes in our doings and in those of Greater Britain over the seas.

Nos. 79 and 80 (June 22nd and 25th) contain a most important essay, entitled, "The Provisioning in war of the Huge Armies of the Future" by Colonel Von Francois, Commanding Queen Elizabeth's 3rd Regiment of Grenadier Guards.

In a publication by Hermann Walther, says the writer, there appeared an article by Major-General Laymann entitled "The Co-operation of the Troops in the Provisioning of the Huge Armies in the Next War" which he proposes to discuss, more especially because it overestimates the importance of co-operation of the troops and does not give the Commissariat Department the credit due to it.

N.B.—This précis is written in the 1st person, as purporting to be a translation.

The article begins with a general discussion on the value of feeding an army well in war, which culminates in the principle derived from experience, that the well fed soldier is equal to the

highest demands of war and can withstand bodily and mental illness. General Laymann is of opinion that this principle will be much more prominent in the wars of the future than it has been up to date, for reasons which owe their origin to the social and moral bringing up of our young men of the present day. He ends his introduction with a short reference to Napoleon's campaigns of 1812 and 1813 and the increased difficulties, which will be experienced in the collection and forwarding of supplies during the next war in consequence of the armies of millions, with which one will have to deal. As only 5 pages of print are devoted to the discussion of these weighty questions of the past and future, which are the foundation of the provisioning of armies in the wars of the future, they must be meant to merely serve the author as introductory matter to the main object, for the article continues as follows:—

- (1) It is desirable to stimulate and train the troops in the preparation of their food in order that they may derive the maximum amount of nourishment from it.
- (2) To prove that the collection of supplies in the immediate theatre of war is not the business of the Commissariat Department, but of the troops.

While the first recommendation has much in its favour, and is interesting to all who prefer cooking by the men individually to cooking in bulk, I should like in the interest of the Commissariat Department, as well as of the troops, to enter a strong protest, against the application of the proposals contained in (2).

The author in this respect underestimates the great progress made by our Commissariat Officers in preparing for the tasks that will fall to them in war, and he does not take into consideration the principles of the modern system of supply in the field, which demand a perfect co-operation between the Commissariat Department and the troops.

Before going into the matter more closely, I should like here to hark back to those points, on which stress has been laid in the introduction, because they concern the greater questions of war and, therefore, are of interest to both professional and lay-men alike.

They will indeed be armies of millions, that will appear on the theatre of war in the next European war, the number of men and horses will far out number those ever employed in any previous war, and their maintenance will influence the strategical plans of the Head-Quarter Staff to an incredible degree. The will of the Commander-in-Chief "to fight and conquer" may indeed carry every thing before it regardless of all considerations, but the question of supplies remains an important factor, which can never be dispensed with in logistics. No leader has been spared this experience and General Laymann draws our attention to two cases in Military History which illustrate this lesson very forcibly.

Napoleon's campaign of 1812 did not prove a failure owing to losses in battle or the cold, but on account of the impossibility of feeding his army of 400,000 men regularly and continuously.

Napoleon lost the Autumn Campaign of 1813, because sickness and desertion reduced his fighting strength in consequence of supplies failing in Saxony, which country had been completely exhausted.

Lieutenant-Colonel Friederich gives us a clear idea of the state of things in Napoleon's war-worn army in his work. "The History of the Autumn Campaign of 1813" which may certainly lay claim to have been founded on the best sources of information and reliable research.

In this book it is written "While the system of supply to the army, when in a state of rest, was already wholly inadequate, it was mostly done away with altogether as soon as movements began. The men lived from hand to mouth. The soldiers received a small store of bread, biscuit, and some rice, and, in addition, they received money in order to buy from the inhabitants what other necessary of life they required."

Such a procedure, which in the case of small armies operating in rich countries in which the scene of operations was constantly shifting, would not only have been practicable, but even advantageous, was bound to fail in a very short time in the case of the enormous armies of 1813, with a war taking place in exhausted districts, in which the theatre of operations changed but little. For this reason it was bound to happen that the French soldier, who as a whole was well-mannered and good-natured, when driven by hunger, became a severe oppressor of the country through which he passed, and that murder, incendiarism, robbery, and plunder followed in the wake of the French army. Hunger loosened the reins of discipline. Hundreds and even thousands dispersed over the country in order to procure food, and the roads and highways were filled with marauders of whom but very few returned to the colours, the remainder either making their way back to the Rhine and Frankfort, or being captured by the light troops of the allies. Even though exaggerated, it is nevertheless significant, when Marshal Ney reported, that before the battle of Dennewitz, already 6,000 deserters from his army had fled to Leipzig; when the Commandant of Leipzig, General Margeron, in order to obliterate the demoralising impression, which the men returning from the army under the most paltry excuses, must make on the inhabitants, when moving through the town, gave the order for these men to be collected in front of the town and to be marched through it in formed bodies; and when Marshall Kellerman at Mainz, in order to hide the sight of these ragged deserters from his reserve troops, proposed to the Emperor, that the sale of uniforms and equipments should be made a capital offence, as only energetic measures could prevent this scandalous conduct.

Napoleon, that experienced master of the whole art of war, that profound thinker and restless spirit certainly left no means untried in order to obviate the pressing dangers of a dearth of supplies, but circumstances were even stronger than he. He was helpless in this respect and was obliged to witness the way hunger demoralised and weakened his army. This gives food for reflection, especially when one considers that it was only a case of providing for an army of

300,000 men. The supply difficulties of 1812 and 1813 are not peculiar to the wars of Napoleon, they appear in all great wars and naturally increase with the size of armies and their distance from the base of supply.

We should pay attention to the principles derived from experience of the war of more ancient times. They never become obsolete, but on the contrary they retain their value and have always found readers and students for whom they have been the means of shortening the long winter evenings in enjoyable study. The wars of the past have for generations proved a mine of knowledge for those in search of it. But when new wars took place, it became apparent that the number of men searching for knowledge was inadequate and time-honored principles had to be dearly learnt and paid for afresh. In war this is much more important as far as supply arrangements are concerned, than all strategical questions and the art of tactics. Battles and combats may be looked on as the acts of a drama on which the eyes of the world are fixed but the collection and forwarding of supplies remain the unostentatious, but at the same time essential work behind the scenes. With us, after every campaign there have always been men, who have attempted to lay down in writing the lessons which were to be learnt from the subsistence of the troops, and even if these writings may not have been read much by the public, still they have yet not been undervalued by those authorities on whom the responsibility for improving the Commissariat Department rested.

The campaign of 1864 presented no difficulties of supply. The small Prussian army of 50,000 men was little larger than an army corps of the present day. Every facility existed for forwarding supplies: the theatre of war favourably situated and our troops, as is the case at manœuvres, scarcely experienced any bodily privations.

The General Report on the Medical Services in the campaign of 1864 prepared by Surgeon-General Lœffler, is full of praise for the arrangements made for provisioning in the field, the direction of which was at that time entrusted to acting Privy Councillor Weidinger. Notwithstanding this, experiences were gained. It was settled that the different parts of the ration were unsuited to practical requirements of the soldiers. The meat ration was increased from 250g to 375g (8 oz. to 12 oz.), the bread ration was decreased from 934g to 750g, (1.86 lb. to 1½ lb.) and a coffee ration was added.

In 1866 the supply arrangements were very defective. Although only 280,000 men, in round numbers, had to be provided for, the Commissariat Department was entirely unequal to the task and the Commanders of troops often found themselves obliged to overlook the fact of their men helping themselves in an unauthorised manner. Our Commissariat Department lacked experience and preparation in peace time. The rapid conclusion of the campaign saved the army from serious catastrophies, although a great deal of sickness prevailed for some time. After the campaign it was well known that the Commissariat Department had failed in its task, but it was not known

how this could be remedied. The new Prussian Regulations for supply in the field, by A. K. O. of the 4th July 1867, provided a way out of the difficulty by the statement: "The provision of ordinary food-supplies should be obtained by billeting and requisitioning in the enemy's country and in case of need from the magazines of one's own country."

This sentence corresponds to the train of thought of Laymann's work. We know, however, that to-day the enormous armies can but seldom count on billeting and requisitioning and that it will be much more the rule to depend on the line of communications for supplies.

Moreover until 1870 the theoretical discussions on the chemical ingredients of the soldiers' field service ration were continued. It was decided that the daily amount necessary to keep up the strength of a man in hard work was—

137g. (4·38 oz.) of albumen, 137g. (4·38 oz.) of fat, and 352g. (11·26 oz.) of hydrate of carbon.

According to this proportion the field service ration of the soldier in 1870 was as follows:—

	Albumen. Grains.	Fat. Grains.	Hydrate of carbon. Grains
375g. (12 oz.) fresh meat	68·2	33·7	...
750g. (1½ lb.) bread	63·7	9·7	393·7
125g. 4 oz. rice	9·4	0·4	97·6
Total ...	141·3	43·8	49·13

The ideas of science on this question to-day are given in the Medical Field Service Regulations, paragraphs 360 and 361.

The difficult question of bringing up supplies was made easier by arrangements made with contractors. The training of commissariat officers remained defective and for this we had to pay dearly in 1870-71. The acquirements of the section and post commanders on the line of communications were also very much below the mark.

During the journey to the Franco-German frontier, the troops revelled in the enjoyment of the free gifts of the population offered to them at the railway stations. Directly the frontier had been crossed, however, damp bivouacs and meagre fare had to be put up with. Supplies were irregular, especially in the centre, where the districts were exhausted.

The difficulties of supply were very great in front of Metz during the first half of the investment, when part of the provisions perished in consequence of the inclement weather, and when foot and mouth disease broke out. The "Hinterland" in which supplies were collected by the cavalry divisions for miles round, did not help much, and the forwarding of supplies failed owing to the railway line Remilly-Bingen becoming blocked. The provisions for the II Army lay there for 30 days, and could not be forwarded on to the troops, owing to the lack of cart transport. Carts and horses were, it is true, hired, but the drivers mostly fled as soon as wet weather or other circumstances made things uncomfortable for them. The enormous stores of provisions had to be unloaded on the railway and perished. The provision train of the III Army on the line Weissenburg-Nancy caused a block on the railway in the same manner.

The work of the Commissariat Department failed in front of Paris at first, because the inhabitants had driven off all the cattle and had partly carried off the supplies in store, destroying the remainder. Only the wine cellars appeared to be inexhaustible. The whole of the supplies of the provision columns had to be used up, purchases had to be made at high prices, and cavalry detachments collected supplies from a great distance. It was not till October that the system of supply was placed on a sound and systematic basis by supplies being forwarded from Germany.

The troops in front of Belfort, at times, suffered severe privations. The country round was exhausted, the forwarding of supplies was irregular and failed completely at the time the battles on the Lisaine were fought. For a long time the troops lived on beef and rice, which caused indigestion. It was only when the railway line Blesme-Dijon was completed that an improvement at last set in. These few examples are enough to prove that the Campaign of 1870-71 was rich in experiences from which lessons for the future might be and have been learnt. It has taught us the lesson that exertions and privations make the body susceptible to infection.

This applies equally to typhoid fever as to affections of the digestive organs. The medical reports on the German army in 1870-71 contain a full and interesting account of this matter and the study of these reports is strongly recommended to all who take an interest in the provisioning of troops.

The following summary compiled by Chief Staff Surgeon Dr. Velde shows clearly how far in excess the casualties, suffered by armies through sickness, have been to those caused by the enemy's weapons up to date.

Losses due to the enemy and disease (especially of the intestines) in the wars of 1854—71.

Army.	Fighting strength.	Number of killed and wounded.		Number of sick admitted to hospital.		Number of wounded, prisoners and sick per 100.		Number of sick for every man wounded or killed.	Number of intestinal * cases admitted to hospital.	
		Total.	Percent- age of strength.	Total.	Percent- age of strength.	Wounded and pri- soners.	Admitted to hos- pital.		Total.	Percent- age of strength.
French 1854—56	99,000 (round numbers.	50,108	50·6	Not available.						
English 1854-56,	45,000 (round numbers).	14,849	33·	142·616	316·6	9·4	90·6	9·6	55·756	123·9
French 1859 ...	1,30,302 ...	19,590	15·	125·950	96·6	13·4	16·6	6·4	Not available.	
Americans 1861—65.	4,92,369 ...	3,28,293	66·7	5417·360	1,100·2	5·7	94·3	16·5	3,926,877	496·2 †
Prussians 1864,	50,000 (round numbers).	2,443	4·9	26·717	42·2	10·4	89·6	8·6	Not available.	
Prussians in Bohemia 1866.	280,000 ...	16,284	5·8	57·989	20·7	21·9	78·1	3·5	Not available.	
Germans 1870—71.	7,88,213 ...	116,821	14·8	475·400	60·3	19·6	80·4	4·1	179,943 †	22·8

* Including dysentery, scurvy and typhoid.

† Diarrhoea and dysentery 367·6 *per cent.* of strength, other intestinal diseases 130·6 *per cent.* Total 498·2 *per cent.*

‡ Diseases of the digestive organs 67,894. Typhoid 73,396. Dysentery, 38,652. Total 179,942.

It is therefore incumbent on all officers of the General Staff and all troop leaders, so to work that the soldier by means of good food should be preserved from sickness or rather, relatively speaking, made proof against it.

We now come to another point of view touched upon in the preface of the book by General Laymann, and that is the moral effect of insufficient food.

General Lyman says: "The spirit of the age which undermines every authority and always places self first, causes a diet, which is not quite sufficient, to be much more dangerous for the spirit of the troops and discipline, than was formerly the case." He adds: "The Roman requires less than the Anglo-Saxon and the Russian soldier does not require nearly so much as the German."

While the allusion to the immense appetite of the Germanic race may be disputed, the assertion about the effect that the spirit of the age has on the spirit of the troops is so true, that we cannot take it seriously enough to heart.

In judging the material in men, we, of course, cannot weigh the German soldiers in one and the same scale, for the district in which they are brought up and their social bringing up must here be taken into account. We have provinces which produce small men who are easily satisfied, and other provinces in which men of dwarf-like stature grow with appetites which the field service ration does not satisfy. We also possess tough men that can last, but there are also whole districts which give us a soft over-indulged stamp of man who gives in when the weight of the knapsack makes itself felt and when his stomach is empty. Besides this, in the German Army there are all kinds of shades of the human temperament and character, such as men of sanguine and nervous temperament, optimists, pessimists, idealists, and realists, etc. This was the case in 1870, and so it will be in any future war. Nevertheless, it cannot be denied that living and ideas of living have undergone a change among our people since 1870. We call it the spirit of the age, and understand by this expression, the effect which the changed conditions of life have on the senses and minds of men. It might be supposed that the moral value of the material of which soldiers are made must increase, owing to the increasing intellectual development of our people, the crowding of our youths into schools and the increasing well being. This is, however, unfortunately not the case. The better conditions of living, under which young men grow up now-a-days, is a bad preparation for the privations and exertions exacted by war. The high wages encourage a thirst for pleasure, and man's nervous system is undermined by the frequenting of dancing saloons and by taking part in carouses. Wealth and good living produce softness, and an inordinate desire for enjoyment, but an empty conception of life is fatal to all soldierly virtues. The hard struggle for existence, on the other hand, steadies the character and steels the

nerves. The blessings of peace are therefore no blessings for the army. If it were possible to compare the merits of the reservist of 1870-71 with those of to-day, it is very probable that the old campaigner would prove to be the better man. The poison of social democracy also eats into the roots of a nation's power and produces unclean saps which stunt the noble and sound shoots of the German character.

If, therefore, we have to reckon with the fact that the moral fibre of the soldier has deteriorated, the question is, what deductions must we draw from this?

Are they those of Laymann's book, which advocates the good feeding of the soldier, for otherwise the weakening of his moral fibre will undermine discipline? No; this would be an unsound and weak deduction. The only correct deduction is, that all military leaders should be untiring in their efforts, to awaken a sense of duty and self-respect in those who in childhood have not had the chance of cultivating a sense of honour or who may have lost all sense for soldierly virtues, and that they should steel the bodies and character of the soldier by means of field manœuvres, which when carried out regardless of weather and time of the year, make heavy demands of the man in the way of endurance and power of standing privation. These are the only means which protect us from the evils caused by the spirit of the age.

We now come to the kernel of the book, which recommends the food being prepared in such a manner that the maximum amount of nourishment may be obtained from it.

General Laymann shows us very clearly from the experiences of our own campaigns and those of other nations, how wretched the food arrangements have always been.

The distribution of the food in wind, dust, rain and to corporals and orderlies, which takes up so much time: keeping the food in dirty handkerchiefs owing to the cooking utensils having to be used to hold water and as cooking pots and dishes as well: the insufficient fuel supply and, lastly, the almost universal incapacity of the soldier in cooking his own food, which robs the tired man of hours of necessary sleep, are all facts which Laymann illustrates by examples and from which he draws the conclusion that we need a book of instructions, which will teach what the officer should do to feed his men well, and that we require practice in preparing food in peace, in order to gain practical experience for feeding troops in war.

Here we are confronted with the main point and to a certain extent the essence of the article, and in the matter of preparing food, find much that is worthy of note. I only regret though, that a predilection for the mince-meat machine pervades the article and, therefore, makes it rather one-sided.

The cooks of any large or small kitchen will unreservedly recognise and appreciate the advantages of the mince-meat machine, but its employment on service, will always depend on the question whether there is any possibility or not of the complicated knife apparatus

causing disease if insufficiently cleaned. If this question should be answered in the affirmative by competent medical authority, then we need not trouble ourselves any further about the mince-meat machine and it will disappear entirely from our calculations.

The cooking experiments by General Laymann with mince-meat machines took place in 1887, that is 20 years ago, and I presume the results were made known to the War Ministry. In the same way, the results of the experiments made with this machine in China and South-West Africa are known to the War Ministry. When in spite of these experiments an order for mince-meat machines was neither made nor recommended, it must be presumed that there were strong grounds for this. Should the introduction of mobile field kitchens follow later on, then the importance of the mince-meat machine will diminish considerably, for the cooking apparatus will enable even fresh killed meat, by means of a high degree of heat, to be quickly made palatable. Now as far as the book of instruction is concerned, I am not aware what purpose it is meant to serve. General Laymann says that the book should contain everything that is important for an officer to know in the interests of the good feeding of his men. If the General means by this, instructions for cooking by the individual man, then we already possess these in "Hints for Cooking." (See Regulations for Subsistence in Peace.)

On the other hand, if the book of instructions is not to be a guide to cooking, but is meant to contain directions in the handling of provisions until ready for use, that is examination, storage and forwarding, then we find all that is worth knowing in the new Field Service Medical Regulations under "Hygiene in War," paragraphs 350-419. I presume that the very clear and precise directions given here, were not accessible to General Laymann when his work went to press.

What the regulations on hygiene in war teach us, is founded on thorough research and experiments and General Laymann will find many questions answered there, which he would like to see cleared up by means of practice in supply duties.

Our officers have certainly not been idle, nor have they lain in a long trance. A great deal of hard work has been done, and if it appears that we are making no progress in many questions of material, then it is only because our hands are tied by the cost.

Into this province comes the question of mobile field kitchens, which owing to the growth of armies and the increasing demands made from the troops, has certainly become a burning one.

The advantages of the mobile kitchens are universally acknowledged and we know that the whole Russian army in the Russo-Japanese war was equipped with them and that they rendered good service not only to the Russians, but to the Japanese also, when they fell into their hands. General Laymann is also in favour of the mobile field kitchens, notwithstanding that he has been brought up on the principles of cooking individually and has cultivated these with extraordinary zeal and I may say scientifically. I for my part have

never been able to raise any enthusiasm over cooking individually, perhaps because I am entirely lacking in all application for and knowledge of the art of cooking. This failing, however, as I have had opportunity of observing during a long period of peace service, I share with a very large number of men whose incapacity as well as mine, a long period of active service would I believe but imperfectly serve to remove. General Laymann confirms this, while relating to us from military history many unsuccessful experiments in cooking, and he says:

"Since my experience of the war of 1866 in which the army nearly came to grief, owing to it not understanding how to turn the available supplies to good account, I have busied myself both theoretically and practically with these questions."

At manœuvres whenever I was able and dared to, I always encouraged cooking in large kettles and have had the satisfaction of knowing that it suited the men well. The specially trained kitchen staff prepared a tasty meal and the remainder of the men were able to rest until the food was ready. I was not always able to grant the men the relief of cooking in bulk, for among my superior officers there were also advocates of cooking individually, who forbade large cooking pots being carried as not being allowed for by the Regulations, and strictly insisted upon the food being prepared by the men themselves in their own cooking pots.

According to our own Regulations we are also to-day bound down to cooking individually, but I believe, however, that the great advantages of cooking in bulk are not disputed by any one. The mobile field kitchens enable cooking in bulk to be carried out most efficiently.

Their greatest advantages are :—

- (1) Regular and clean handling of the food, up to its preparation and while it is being cooked, by a trained *personnel*.
- (2) Rapid cooking during the march, whereby it is possible to feed the men as soon as they reach camp or during the longer intervals in a battle.
- (3) Using up the food to its full extent as opposed to the waste which is unavoidable when it is distributed.
- (4) Releasing the combatant ranks from individual cooking which takes up so much time and is so fatiguing.
- (5) Easy control of the supply and cooking arrangements by the supply officer and his staff.

Of course searching experiments must be made before their final introduction, and we know that these have been carried out for years according to the Reports on the manœuvres of individual army corps.

It is not an easy matter to technically explain the extensive requirements, which are necessary in the construction of kitchen carts.

To these requirements in my opinion the following belong among others :—

- (1) Easy steering facilities and mobility at the trot.

- (2) The total weight of the cart when loaded should be suitable to two-horse draught.
- (3) Sufficient room and facilities for cleaning the cooking pots of a company.
- (4) The provision of a receptacle for coffee besides the cooking kettles.
- (5) Possibility of cooking, or rather relatively speaking keeping the water warm during the march, so that on setting out the cooking pots can be filled with enough for a full meal.
- (6) Enough storage space for a second meal.
- (7) Carriage for the cooking personnel (2 men).
- (8) Carriage for cooking utensils and butcher's tools.

As soon as we are provided with mobile field kitchens, I consider it will be very desirable that they should be used at manœuvres. Manœuvres, should as far as possible resemble real warfare, and this should, therefore, also apply to supply arrangements, so that leaders and men may go through a period under service conditions entailing fatiguing marches and fights and bivouac on the ground according to the general situation. The men should not be fed in billets, but from the mobile field kitchens, which march with the 1st Line Transport. Supplies should be collected by purchase or brought up by transport trains. Much could be said about this kind of practice in supply arrangements, but this is outside the scope of this article. I now come to the collection of supplies in the theatre of operations, which General Laymann wishes to leave entirely in the hands of the troops, for he states, that the collection and purchase of supplies by the Commissariat Department, yields less than when carried out by the troops themselves and checks their activity.

General Laymann wishes there to be a sharp distinction between the collection of supplies in the area occupied by the troops as opposed to remoter areas. The first is to be exclusively the domain of the troops and the latter that of the Commissariat Department. Such a distinction is quite impossible and can only be regarded as a theoretical proposition put forward by those who are not sufficiently grounded in the principles of our modern Commissariat arrangements.

The collection of supplies by the troops (by purchase and requisition) is neither bound down nor limited by the present regulations, and it is in fact demanded in all cases where billeting fails. In practice the procedure is as follows.

If the owners of the houses on which men are billeted cannot undertake the supply of food or the troops bivouac, then they can be fed from their ration carts and see that these are refilled by purchase and requisition, or if these are both impossible, from the supplies in the transport trains. For this purpose the troops have supply officers at their disposal, who must use every endeavour to replenish the ration carts (later on the field kitchen and ration carts) by purchase or requisition. Should both of these methods fail owing to

the exhaustion of the country, then recourse is had to the contents of the army corps supply columns.

Now it would be entirely wrong if these questions of replenishment—by purchase, requisition or supply columns—had to be settled by the supply officer. For this time fails and the probable result would be that the last source—the supply column—could not be tapped owing to it being too far off. Here it is exactly the work of the Commissariat Department which thinking ahead according to the directions of the divisional and corps commanders must explore and work ahead.

How the Commissariat Department can do justice to this task, I will explain below. Normally the work of supply has in any case been fulfilled, as soon as the supply officers have seen, on the troops going into camp, how the rationing and replenishment of supplies will work out until the commencement of operations next day.

The cases in which billeting is possible, will in war be exceptional. Whoever marches with the main body of an army and does not belong to the foremost detachments of the advanced guards, can never count on this. Also purchase and requisition in the immediate theatre of war will soon find a limit. Every one must understand this, who during extensive manœuvres has ever attempted to purchase supplies from the neighbouring districts. Wherever the masses of troops of the present day may halt, they have the effect of locusts and in a very short time have devoured the last blade of grass. The centre of gravity of supply and its safest support, therefore, always rests in the transport service, for the security of which the Commissariat officers both with the troops and on the line of communications and the representative officials at home co-operate.

Without co-operation between the Commissariat Department and the troops, the supply of the armies of millions of the present day is out of the question. The sphere of work of the Commissariat Department and specially that of the Divisional Commissariat reaches as far as the supply of the battalion, whose supply officer to a certain extent acts as a go-between between the Commissariat Department and the troops. A supply officer who loses connection between the Divisional Commissariat and the troops, or neglects his work, cannot fulfil this difficult task, he is in a false position and must be relieved.

It will perhaps serve to a better understanding and illustrate the method of co-operation, if I sketch shortly what I consider to be the work of the Divisional Intendant and the supply officers, for example, during an advance.

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300,000 men. The supply difficulties of 1812 and 1813 are not peculiar to the wars of Napoleon, they appear in all great wars and naturally increase with the size of armies and their distance from the base of supply.

We should pay attention to the principles derived from experience of the war of more ancient times. They never become obsolete but on the contrary they retain their value and have always found readers and students for whom they have been the means of shortening the long winter evenings in enjoyable study. The wars of the past have for generations proved a mine of knowledge for those in search of it. But when new wars took place, it became apparent that the number of men searching for knowledge was inadequate and time honored principles had to be clearly learnt and paid for at once. In war this is much more important as far as supply arrangements are concerned, than all strategical questions and the art of tactics. Battles and combats may be looked on as the acts of a drama on which the eyes of the world are fixed but the collection and forwarding of supplies remain the unostentatious, but at the same time essential, work behind the scenes. With us, after every campaign there have always been men, who have attempted to lay down in writing the lessons which were to be learnt from the subsistence of the troops, and even if these writings may not have been read much by the public, still they have yet not been undervalued by those authorities on whom the responsibility for improving the Commissariat Department rested.

The campaign of 1864 presented no difficulties of supply. The small Prussian army of 50,000 men was little larger than an army corps of the present day. Every facility existed for forwarding supplies, the theatre of war favourably situated and our troops, as in the case at manoeuvres, scarcely experienced any bodily privations.

The General Report on the Medical Services in the campaign of 1864 prepared by Surgeon General Leffler, is full of praise for the arrangements made for provisioning in the field, the direction of which was at that time entrusted to acting Privy Councilor Wendinger. Notwithstanding this experience was gained. It was seen that the different parts of the ration were unsuited to practical requirements of the soldiers. The meat ration was increased from 250 gr. to 375 gr., 8 oz. to 12 oz., the bread ration was decreased from 944 gr. to 750 gr., 18 lb. to 16 lb. and the ration was altered.

In 1866 the supply arrangements were very defective. Although only 280,000 men in total numbers had to be provided for, the Commissariat Department was entirely unequal to the task and the Commanders of troops often found themselves obliged to overlook the fact of their men being provided with provisions in an unsatisfactory manner. Our Commissariat Department lacks experience and preparation in peace time. The staff of the Commissariat Department is too small to be able to cope with the great demands which are made upon it in war time. After the campaign it was well known that the Commissariat Department had failed in its task, but it was not known

how this could be remedied. The new Prussian Regulations for supply in the field, by A. K. O. of the 4th July 1867, provided a way out of the difficulty by the statement: "The provision of ordinary food-supplies should be obtained by billeting and requisitioning in the enemy's country and in case of need from the magazines of one's own country."

This sentence corresponds to the train of thought of Laymann's work. We know, however, that to-day the enormous armies can but seldom count on billeting and requisitioning and that it will be much more the rule to depend on the line of communications for supplies.

Moreover until 1870 the theoretical discussions on the chemical ingredients of the soldiers' field service ration were continued. It was decided that the daily amount necessary to keep up the strength of a man in hard work was—

137*g.* (4·38 oz.) of albumen, 137*g.* (4·38 oz.) of fat, and 352*g.* (11·26 oz.) of hydrate of carbon.

According to this proportion the field service ration of the soldier in 1870 was as follows:—

—				Albumen. Grains.	Fat. Grains.	Hydrate of carbon. Grains
375 <i>g.</i> (12 oz.) fresh meat	...	...	...	68·2	33·7	...
750 <i>g.</i> (1½ lb.) bread	...	...	...	63·7	9·7	393·7
125 <i>g.</i> 4 oz. rice	...	...	...	9·4	0·4	97·6
Total				141·3	43·8	49·13

The ideas of science on this question to-day are given in the Medical Field Service Regulations, paragraphs 360 and 361.

The difficult question of bringing up supplies was made easier by arrangements made with contractors. The training of commissariat officers remained defective and for this we had to pay dearly in 1870-71. The acquirements of the section and post commanders on the line of communications were also very much below the mark.

During the journey to the Franco-German frontier, the troops revelled in the enjoyment of the free gifts of the population offered to them at the railway stations. Directly the frontier had been crossed, however, damp bivouacs and meagre fare had to be put up with. Supplies were irregular, especially in the centre, where the districts were exhausted.

The difficulties of supply were very great in front of Metz during the first half of the investment, when part of the provisions perished in consequence of the inclement weather, and when typhoid and mouth disease broke out. The "Hunterland" in which supplies were collected by the cavalry divisions for miles round, did not help much, and the forwarding of supplies failed owing to the railway line Remilly-Bingen becoming blocked. The provisions for the II Army lay there for 30 days, and could not be forwarded on to the troops, owing to the lack of cart transport. Carts and horses were, it is true, hired, but the drivers mostly fled as soon as wet weather or other circumstances made things uncomfortable for them. The enormous stores of provisions had to be unloaded on the railway and perished. The provision train of the III Army on the line Weissenburg Nancy caused a block on the railway in the same manner.

The work of the Commissariat Department failed in front of Paris at first, because the inhabitants had driven off all the cattle and had partly carried off the supplies in store, destroying the remainder. Only the wine cellars appeared to be inexhaustible. The whole of the supplies of the provision columns had to be used up, purchases had to be made at high prices, and cavalry detachments collected supplies from a great distance. It was not till October that the system of supply was placed on a sound and systematic basis by supplies being forwarded from Germany.

The troops in front of Belfort, at times, suffered severe privations. The country round was exhausted, the forwarding of supplies was irregular and failed completely at the time the battles on the Laine were fought. For a long time the troops lived on beet and rice, which caused indigestion. It was only when the railway line Blaine-Dijon was completed that an improvement at last set in. These few examples are enough to prove that the Campaign of 1870-71 was rich in experiences from which lessons for the future might be and have been learnt. It has taught us the lesson that exertions and privations make the body susceptible to infection.

This applies equally to typhoid fever as to affections of the digestive organs. The medical reports on the German army in 1870-71 contain a full and interesting account of this matter and the study of these reports is strongly recommended to all who take an interest in the provisioning of troops.

The following summary compiled by Chief Staff Surgeon Dr. Valde shows clearly how far in excess the casualties, suffered by armies through sickness have been to those caused by the enemy's weapons up to date.

Losses due to the enemy and disease (especially of the intestines) in the wars of 1854—71.

Army.	Fighting strength.	Number of killed and wounded.		Number of sick admitted to hospital.		Number of wounded, prisoners and sick per 100.		Number of sick for every man wounded or killed.	Number of intestinal cases admitted to hospital.	
		Total.	Percent- age of strength.	Total.	Percent- age of strength.	Wounded and pri- soners.	Admitted to hos- pital.		Total.	Percent- age of strength.
French 1854—56	90,000 (round numbers.)	50,108	50.6	Not available.						
English 1854-56,	45,000 (round numbers).	14,849	33.	142,616	316.6	9.4	90.6	9.6	55,756	123.9
French 1859 ...	1,30,302 ...	19,590	15.	125,950	96.6	13.4	86.6	6.4	Not available.	
Americans 1861—65.	4,92,369 ...	3,28,203	66.7	5417,360	1,100.2	5.7	94.3	16.5	3,926,877	49.2 †
Prussians 1864,	50,000 (round numbers).	2,443	4.9	26,717	42.2	10.4	89.6	8.6	} Not available.	
Prussians in Bohemia 1866.	280,000 ...	16,284	5.8	57,969	20.7	21.9	78.1	3.5		
Germans 1870—71.	7,88,213 ...	116,821	14.8	475,400	60.3	19.6	80.4	4.1	179,943 ‡	22.8

* Including dysentery, scurvy and typhoid.

† Diarrhoea and dysentery 367.6 per cent. of strength, other intestinal diseases 130.6 per cent. Total 498.2 per cent.

‡ Diseases of the digestive organs 67,894. Typhoid 73,396. Dysentery, 38,652. Total 179,942.

It is therefore incumbent on all officers of the General Staff and all troop leaders, so to work that the soldier by means of good food should be preserved from sickness or rather, relatively speaking, made proof against it.

We now come to another point of view touched upon in the preface of the book by General Laymann, and that is the moral effect of insufficient food.

General Laymann says: "The spirit of the age which undermines every authority and always places self first, causes a decline which is not quite sufficient, to be much more dangerous for the spirit of the troops and discipline, than was formerly the case." He adds: "The Roman requires less than the Anglo-Saxon and the Russian soldier does not require nearly so much as the German."

While the allusion to the immense appetite of the German race may be disputed, the assertion about the effect that the spirit of the age has on the spirit of the troops is so true, that we cannot take it seriously enough to heart.

In judging the material in men, we, of course, cannot weigh the German soldiers in one and the same scale, for the district in which they are brought up and their social bringing up must here be taken into account. We have provinces which produce small men who are easily satisfied, and other provinces in which men of distinct stature grow with appetites which the field service ration does not satisfy. We also possess tough men that can last, but there are also whole districts which give us a soft over-indulged stamp of men who gives in when the weight of the knapsack makes itself felt or when his stomach is empty. Besides this, in the German Army there are all kinds of shades of the human temperament and character, such as men of sanguine and nervous temperament, optimists, pessimists, idealists, and realists, etc. This was the case in 1870, and so it will be in any future war. Nevertheless, it cannot be denied that living and ideas of living have undergone a change among our people since 1870. We call it the spirit of the age, and understand by this expression, the effect which the changed conditions of life have on the senses and minds of men. It might be supposed that the moral value of the material of which soldiers are made must increase, owing to the increasing intellectual development of our people, the crowning of our youths into soldiers, and the increasing well-being. This is, however, not the case, and not the case. The better conditions of living, under which they are brought up now, always as a bad preparation for the privations and exertions exacted by war. The high wages encourage a thirst for pleasures, and the nervous system is undermined by the frequenting of dancing saloons and by taking part in carousals. Wealth and good living produces softness, and an immoderate desire for enjoyment, but an empty conception of life is fatal to a soldier's virtues. The hard struggle for existence, on the other hand, steels the character and steadies the

nerves. The blessings of peace are therefore no blessings for the army. If it were possible to compare the merits of the reservist of 1870-71 with those of to-day, it is very probable that the old campaigner would prove to be the better man. The poison of social democracy also eats into the roots of a nation's power and produces unclean saps which stunt the noble and sound shoots of the German character.

If, therefore, we have to reckon with the fact that the moral fibre of the soldier has deteriorated, the question is, what deductions must we draw from this?

Are they those of Laymann's book, which advocates the good feeding of the soldier, for otherwise the weakening of his moral fibre will undermine discipline? No; this would be an unsound and weak deduction. The only correct deduction is, that all military leaders should be untiring in their efforts, to awaken a sense of duty and self-respect in those who in childhood have not had the chance of cultivating a sense of honour or who may have lost all sense for soldierly virtues, and that they should steel the bodies and character of the soldier by means of field manœuvres, which when carried out regardless of weather and time of the year, make heavy demands of the man in the way of endurance and power of standing privation. These are the only means which protect us from the evils caused by the spirit of the age.

We now come to the kernel of the book, which recommends the food being prepared in such a manner that the maximum amount of nourishment may be obtained from it.

General Laymann shows us very clearly from the experiences of our own campaigns and those of other nations, how wretched the food arrangements have always been.

The distribution of the food in wind, dust, rain and to corporals and orderlies, which takes up so much time: keeping the food in dirty handkerchiefs owing to the cooking utensils having to be used to hold water and as cooking pots and dishes as well: the insufficient fuel supply and, lastly, the almost universal incapacity of the soldier in cooking his own food, which robs the tired man of hours of necessary sleep, are all facts which Laymann illustrates by examples and from which he draws the conclusion that we need a book of instructions, which will teach what the officer should do to feed his men well, and that we require practice in preparing food in peace, in order to gain practical experience for feeding troops in war.

Here we are confronted with the main point and to a certain extent the essence of the article, and in the matter of preparing food, find much that is worthy of note. I only regret though, that a predilection for the mince-meat machine pervades the article and, therefore, makes it rather one-sided.

The cooks of any large or small kitchen will unreservedly recognise and appreciate the advantages of the mince-meat machine, but its employment on service, will always depend on the question whether there is any possibility or not of the complicated knife apparatus

causing disease if insufficiently cleaned. If this question should be answered in the affirmative by competent medical authority, then we need not trouble ourselves any further about the mince-meat machine and it will disappear entirely from our calculations.

The cooking experiments by General Laymann with mince-meat machines took place in 1887, that is 20 years ago, and I presume the results were made known to the War Ministry. In the same way, the results of the experiments made with this machine in Central and South-West Africa are known to the War Ministry. With all this in spite of these experiments an order for mince-meat machines was neither made nor recommended, it must be presumed that there were strong grounds for this. Should the introduction of mince-meat field kitchens follow later on, then the importance of the mince-meat machine will diminish considerably, for the cooking apparatus will enable even fresh killed meat, by means of a high degree of heat to be quickly made palatable. Now as far as the book of instructions is concerned, I am not aware what purpose it is meant to serve. General Laymann says that the book should contain everything that is important for an officer to know in the interests of the good feeding of his men. If the General means by this, instructions for cooking by the individual man, then we already possess these in "Hints for Cooking" (See Regulations for Subsistence in Peace).

On the other hand, if the book of instructions is not to be a guide to cooking, but is meant to contain directions in the handling of provisions until ready for use, that is examination, storage, and forwarding, then we find all that is worth knowing in the new *Feld-Service Medical Regulations* under "Hygiene in War," paragraphs 350-419. I presume that the very clear and precise directions given here, were not accessible to General Laymann when his work went to press.

What the regulations on hygiene in war teach us, is founded on thorough research and experiments and General Laymann will find many questions answered there, which he would like to see cleared up by means of practice in supply duties.

Our officers have certainly not been idle, nor have they taken a long trance. A great deal of hard work has been done, and it appears that we are making no progress in many questions of material, then it is only because our hands are tied by the cost.

Into this province comes the question of mobile field kitchens, which owing to the growth of armies and the increasing demand made from the troops, has certainly become a burning one.

The advantages of the mobile kitchens are universally acknowledged and we know that the whole Russian army in the Russo-Japanese war was equipped with them and that they rendered good service not only to the Russians, but to the Japanese also, when they fell into their hands. General Laymann is also in favour of the mobile field kitchens, notwithstanding that he has been brought up on the principles of cooking individually and has cultivated these with extraordinary zeal and I may say with success. I for my part have

never been able to raise any enthusiasm over cooking individually, perhaps because I am entirely lacking in all application for and knowledge of the art of cooking. This failing, however, as I have had opportunity of observing during a long period of peace service, I share with a very large number of men whose incapacity as well as mine, a long period of active service would I believe but imperfectly serve to remove. General Laymann confirms this, while relating to us from military history many unsuccessful experiments in cooking, and he says:

"Since my experience of the war of 1866 in which the army nearly came to grief, owing to its not understanding how to turn the available supplies to good account, I have busied myself both theoretically and practically with these questions."

At manoeuvres whenever I was able and dared to, I always encouraged cooking in large kettles and have had the satisfaction of knowing that it suited the men well. The specially trained kitchen staff prepared a tasty meal and the remainder of the men were able to rest until the food was ready. I was not always able to grant the men the relief of cooking in bulk, for among my superior officers there were also advocates of cooking individually, who forbade large cooking pots being carried as not being allowed for by the Regulations, and strictly insisted upon the food being prepared by the men themselves in their own cooking pots.

According to our own Regulations we are also to-day bound down to cooking individually, but I believe, however, that the great advantages of cooking in bulk are not disputed by any one. The mobile field kitchens enable cooking in bulk to be carried out most efficiently.

Their greatest advantages are :—

- (1) Regular and clean handling of the food, up to its preparation and while it is being cooked, by a trained *personnel*.
- (2) Rapid cooking during the march, whereby it is possible to feed the men as soon as they reach camp or during the longer intervals in a battle.
- (3) Using up the food to its full extent as opposed to the waste which is unavoidable when it is distributed.
- (4) Releasing the combatant ranks from individual cooking which takes up so much time and is so fatiguing.
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If the owners of the houses on which men are billeted have to undertake the supply of food for the troops, however, then they may be asked to put their ration carts and see that these are refilled by purchase and transport of it if the stores be themselves taken from the ration carts in transport trains. For this purpose the troops have always officers at their disposal who can stand as representatives of the troops in the ration carts, either on the market place or in the case of purchase in the shops. Such is the nature of the service in the following

the exhaustion of the country, then recourse is had to the contents of the army corps supply columns.

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into the country. The three secretaries have each special bodies of troops assigned to them, to which they ride during the march, in order to find out the condition of the supplies and to receive indents from the troops.

The controller and the four magazine assistants he sends on ahead, when possible, under cavalry escort, to the theatre of operations pointed out by the Divisional Commander, to investigate the supply resources in the district and, if necessary, to make purchases and collect supplies.

The supply officer keeps himself well acquainted with the requirements of the battalion and must, for example, be able to answer the following questions:—

How did the rationing go the day before ?

Did the men receive breakfast before starting ?

Are the emergency rations complete ?

Have the men got any rations with them besides the emergency rations ?

What are the contents of the ration and forage waggons ?

Have the supplies on the ration carts been replenished ?

When therefore the intendance secretary arrives, the supply officer can give him exact information and make known his own requirements. All the information collected by the intendance secretaries is sent to the Divisional intendant, who is now in a position to make the necessary arrangements at the right time.

An extract of the reconnaissance can then be published in the supply order which is issued as a divisional order of the day to the troops before they retire to rest.

I should not like it to remain unmentioned, that the value and significance of such co-operation is well known to our Commissariat Officers of to-day. Their future efficiency depends on a thorough preparation in peace, which has considerably increased their intelligence for the tasks of the Commissariat Department in war, thanks to the encouragement which the War Ministry and the Chief of the General Staff are continually giving.

I hope to have proved above that the ideal of a good system of supply for the troops does not, as General Laymann thinks, depend on a limitation of the Commissariat Department's work at home and on the distant theatre of war, and not on the troops themselves using up the supplies of the immediate theatre of war, also not on the introduction of a book of instructions and mince-meat machines, but solely on a faithful co-operation between the Commissariat Department and the troops.

There is a short account of the old "King's German Legion," 1803-1816, in the number of July 4th. The regiments which composed the legion now bear the name "Hanover" before their regimental number. The Emperor made a special inspection of them a few years back, and made particular reference to their past services and traditions.

In the numbers of July 6th and 9th is printed a lecture given by Major Inouye of the Imperial Japanese Army to the officers of the garrison of Stettin on the siege of Port Arthur. Major Inouye was on the general staff of the besieging army. He begins with a sketch of the history of Port Arthur, and briefly describes the chief events of the siege.

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3. *Proportion of the different arms.*—The arm which accords to the general situation must be regarded as the most important, cannot be too strong, whilst the strength of each auxiliary arm is dependent on it. To determine this proportion for all time is not feasible.

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5. *The space available for the artillery in battle depends on the fighting front taken up by the infantry.* This space will vary in the most extraordinary way according to the object of the fighting, the peculiarities of the *terrain*. In open country and in the defence it will increase, but will decrease in close country and in the attack.

6. *The ideal amount of space and mobility.*—An army corps (German) in the attack requires 6,550 yards of front, and were able to have this it would place 300 guns in one continuous line; this however, must be regarded purely as an ideal, as such space could practically never be obtained. If more troops are packed on a certain amount of ground than it can conveniently support, then the result of overcrowding will militate against successful operation.

7. *Numbers and space in the Campaign of 1870.*—At Metz in 1870 the occupation of too confined a front was less felt, as opposed to the interior French artillery than would have been the case against a foe of equal calibre, and although some of the artillery fought in very crowded lines, it frequently happened nevertheless that every available gun could not be brought into play. At Worth only 250 out of 480 German guns were engaged, and Gravelotte 10 batteries could not be brought into line. At the Battle of Bapaume many German guns were lost, and at Weissenburg where there was a great space, all the guns were not brought up. At Sedan the same condition prevailed for 100 batteries could find no room to deploy, while at Spicheren the artillery had to be content with positions from which only a small effect could be obtained.

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9. *Battle training.*—It is difficult to place strong organised bodies of artillery into the fight on a narrow front. For this are required a high standard of tactical training, a good eye for country and mutual co-operation in all movements.

10. *Numbers and space on the march.*—Since 1870 the artillery baggage has increased, and thus the army has become more cumbrous, the march of the infantry to the battle field delayed and the mobility of the troops consequently decreased. Attempts must therefore be made to reduce the space occupied by the artillery.

11. *The strength of the Artillery and leadership.*—A commander who brings his army to its objective by means of rapid strokes and great mobility, and understands how to select his battlefield, will be able to do with less artillery than a leader of slower intellect possessing less initiative. An inferior commander will need stronger artillery, while a genius will know how to dispense with its long columns and large amount of baggage.

12. *Conclusion.*—The following may be taken as principles with regard to numbers and space in connection with the employment of artillery:—

(a) The width of the infantry fight determines as a rule the total space available for the artillery.

(b) The employment of this space for placing guns in position is, however, dependent on and consequently limited by the most varied conditions (range of sight, distance, light, accessibility, formation of the ground, cover, etc.).

(c) In order to obtain sufficient room for a proportionally large number of guns, these guns must be fought in several lines (one line firing over those on front). This, however, requires thorough training in peace-time.

FRENCH PAPERS.

(*Revue Militaire Suisse*, April, 1907.)

The main feature of this number is a reproduction of the new Swiss Military law. A short *résumé* of this is accordingly given in this number.

A commentary on the law in the May and June numbers will also be found briefly summarised in due sequence.

CHAPTER I.

THE NEW MILITARY LAW.

This chapter lays down that every male in Switzerland is either performing personal military service or paying an exemption tax. The age for service is from the 20th to the end of the 48th year.

Besides cases of physical, mental or moral unfitness, which are recognised as debarring a man from the privilege of rendering personal service, certain classes are exempt, such as high officials, functionaries, members of the legislature, clergy, medical men, &c.

It may be noted that compensation is given by the State to the families left in distress through the absence of the breadwinner from military service.

CHAPTER II.

CLASSIFICATION OF THE SWISS ARMY.

This starts with the classification of the Swiss army. There are three divisions corresponding to the ages of the men who compose them, these are the active army (*Armée*), with men of 20 to 42 years of age, and the reserves (*Armée* and *Armée*), with men of 43 to 48 and 49 to 48 respectively.

In war the three divisions are ordered in the following manner:

This chapter continues with a description of the composition of the Swiss army, which does not differ materially from that of other European armies.

Howsoever the conscription is carried out in a special system, the cost is being shared between the State and the individual citizen. The State provides the large armaments, but the cost of the small arms and the equipment is borne by the individual citizen. The cost of the service is borne by the individual citizen.

A law is made provision for the cost of the service by the State. In the case of the individual citizen, the State bears the cost of the service.

Factors for the maintenance of the army are mentioned by the State.

As a rule the soldier is armed and equipped by the canton in which he is recruited, and retains the articles in his possession and at his own risk during the period of his service. He is not permitted to use his equipment for other than military purposes.

The arms and equipment are the property of the Confederation, the individual cannot dispose of the articles. In cases where a man is not capable of looking after his equipment it may be withdrawn.

At the termination of the personal service the man becomes the owner of his arms and equipment.

Officers are provided by the State with arms, equipment and saddlery (in cavalry), and are compensated at a fixed rate for their expenses in purchasing uniform.

The equipment of corps is provided by the State, and stored at the place of assembly. Vehicles are hired.

War reserves of material and explosives are always maintained by the Confederation.

All arms and equipment in the possession of men are inspected annually. The men who are called up for training are inspected during the training; those not called up are inspected on fixed days in the communes. All stores requiring repair or replacement are dealt with on these occasions.

The equipment of corps is inspected every two years, the work being done by their own commanders in the case of infantry and engineers, otherwise by the Military Department. The object of the inspection is to insure that the equipment is properly stored, that there are no deficiencies and that everything is prepared for a rapid mobilisation.

CHAPTER III.

TRAINING OF THE ARMY.

I.—Preparatory Instruction.

The cantonal schools include a regular course of gymnastics as part of the instruction. Public associations continue the boy's physical education after he leaves school, and teach him the use of the rifle. The State exercises a constant and careful supervision over the physical education of the youth of the country up to the time of recruitment for military service. Arms, ammunition, etc., are provided free for the shooting clubs and associations, and other assistance is given as required.

II.—Corps of Instructors.

A regular corps of instructors is maintained for the training of recruits, and for the schools of instruction. The officers of this corps form part of the Army, and receive promotion like other officers.

The training of the troops generally is in the hands of their own officers.

The Military Department decides the general lines of training, and responsible officers work out programmes on these lines. In all schools of instruction must be organised, so that the training shall be of a uniform nature. Dates for courses, etc., are arranged so as to present the least possible inconvenience to the exercise of civil duties.

The Federal Polytechnic School has a section for the natural sciences, which is intended particularly for officers of the Army, who may desire to extend their military knowledge.

III.—Recruit Training.

The periods of training are:—Infantry and engineers, 65 days; cavalry, 90 days; artillery and fortress troops, 95 days; other services, 60 days.

Specialists, as armourers, buglers, shoing smiths, etc., either receive special courses and only 40 days' recruit training, or are doing their work during the recruit training.

IV.—Periodical Training.

The *elite* is called out for training every year. The periods are 14 days for artillery and fortress troops, and eleven days for other services. But an individual soldier only attends seven trainings during his term of service (8 in cavalry). Sergeants and senior non-commissioned officers attend ten trainings.

In these trainings manoeuvres with small units take place alternately with those of large bodies.

The *landwehr* is called out every four years (except the cavalry for eleven days' training), but each man below the rank of sergeant performs only one training during his *landwehr* service.

The Federal assembly is empowered to order special trainings as may be required, and also to call out parties from the *landwehr* for three-day courses of a special nature. The Federal Council can also call out the *land-sturm* (in certain cases of emergency) for training.

V.—Obligatory and Voluntary Musketry.

Every man who carries a rifle and belongs to the *elite* or to the *landwehr*, every non-commissioned officer or subaltern up to rank including subaltern officers, carries out an annual regulation course. For this purpose private rifle associations subsidised by the State are used, similarly any other club or institution which encourages military knowledge is assisted by the State.

VI.—Training of Non-commissioned Officers.

Special courses are prescribed before appointment to the non-commissioned ranks.

VII.—Training of Officers.

The commissioned ranks can only be reached through the non-commissioned. Before promotion to a commission the non-commissioned officer undergoes special instruction. The courses vary in

days for infantry, cavalry and fortress troops; 105 days for artillery and engineers; 60 in the train, and 45 for medical, supply and veterinary services.

Officers undergo courses of varying duration before promotion. Further, they are put through musketry training, and tactical and technical courses of instruction as may be necessary.

VIII.—General Staff.

There are three staff courses:—

No. I for future general staff officers.

No. II for captains (42 days).

No. III for officers who have been through Nos. I and II (21 days).

Officers of the general staff go through the training of the staffs to which they happen to be attached. They may also be called upon to undergo special courses like other officers. They are detailed for staff work by roster every year. Railway officers go through a 20 days' course.

IX.—Staff Training.

Staffs are called out every two years for eleven days' tactical training. The course is supervised alternately by the Army Corps and Divisional Commanders. Also every two years exercises in strategy take place. Senior officers such as Divisional Commanders are detailed to take part in these.

X.—Inspections.

All training courses and schools of instruction are inspected by some senior officers according to rules laid down, *e.g.*, a training is inspected by the immediate superior of the officer conducting the training, etc., etc.

CHAPTER IV.

MILITARY ADMINISTRATION.

I.—The Confederation and the Cantons.

The Federal Council carries out the higher military administration through the intermediary of the Swiss Military Department. In the cantons the cantonal authorities carry out the administration under the Confederation. The Federal Council exercises executive control in all matters of duties and exercises, but the rules for the administration are left to the Federal Assembly.

The Federal Council divides the country into military districts, the idea being that a whole division of troops should be recruited in one canton. The canton is further subdivided into districts corresponding to an infantry regiment of the *élite*.

It is the business of the cantons to demand military service of every eligible man living within their limits; and, to assist in the

registration of such men, every permit to drill is reported to the local military authorities. The cantons keep these registers. The military authorities merely maintain lists of units. An officer is told off in each district for the registers of men.

When possible the cantons form their own units complete with companies, batteries, etc. The Confederation forms certain units also, and details any extra officers, etc., required for the cantons. The cantons appoint their own officers, the Federal Council appointing staffs, etc., to units formed from several cantons.

The Confederation provides the general equipment and material, while the cantons furnish the personal equipment of the troops. Complete supplies of all descriptions for an army are always kept ready.

The Federal Assembly indemnifies the cantons for their expenditure on equipment.

The cantons are responsible for the provision and preservation of the equipment for their own troops, so that nothing should be lacking on mobilisation. The Confederation is responsible for the rest of the war material.

The Federal Council lays down the rules for mobilisation, but the work is done in the cantons.

All supplies of provisions, all buildings and works for military purposes are exempt from any local taxes.

II.—Military Administration of the Confederation.

The Chancellery of the Military Department is under the control of the chief of that department. It conducts all correspondence and is in charge of all proposals for submission to the Federal Council. Under it are the heads of the services, viz.:

- Chief of the General Staff
- Chiefs of each arm of the service
- Chief Medical Officer.
- Chief Intendance Officer
- Chief of the Technical Section, etc., etc.

The chiefs of the various services have the duties of preparing reports, orders, etc., for the armed budget of their arms. They are authorised in the name of the Military Department and sign all orders and reports.

The General Staff is responsible for the following:

- Personnel and recruitment
- Mobilisation
- Armaments and equipment

The chief of staff is the general officer in command, and supervises all the services and the staffs of the various arms.

- General staff of the General Staff
- Personnel
- Mobilisation and recruitment
- Armaments and equipment
- Intendance
- Quarters and garrisons

Administration of units and their Staff.

Organisation and supervision of training and instruction in units.

Officers (promotion, etc.)

Similarly the chiefs of the non-combatant services.

The following are special:—

Infantry.

Organisation and direction of central schools and musketry.

Cavalry.

Purchase, training and distribution of remounts.

General administration of all questions relating to horses.

Artillery.

Administration and training of troops belonging to the train, and officers' orderlies.

Engineers.

Supervision of Engineer Officer's instruction, supply of explosives and materiel for destructive work, prepares fortifications to be built in time of war.

Fortifications.

Administration and building of permanent fortifications.

Medical.

Administration of the medical charge of the army.

Veterinary.

General supervision of all veterinary work.

Commissariat.

Provision and distribution of food and other supplies. Has charge of all stores for the same. Administers barracks.

Military Technical Section.

Charged with the provision and improvement of war materiel. Manufactures of war stores and proof of guns, etc. Manufacture of ammunition. Hands over completed matériel to the intendance.

Intendance.

Arsenals, storage, and distribution of ordnance, war materiel ammunition, accoutrements, etc., etc., all ordnance duties.

Topographic Section.

Prepares maps, and triangulates.

III.—Command.

The chain of responsibility is intended to give each commander entire control over the command, for which he is responsible. Each commander prepares his troops for war, and may call upon subordinates for reports. Each superior commander makes his reports and proposals for the consideration of higher authority.

A committee of national defence composed of the commanders of army corps, the chiefs of the general staff and the infantry service, under the chief of the Military Department as president, deliberates on all important questions of the defence of the country. As soon, however, as the commander-in-chief is nominated (in war time) this committee ceases to work.

- (2) The total weight of the cart when loaded should be suitable to two-horse draught.
- (3) Sufficient room and facilities for cleaning the cooking pots of a company.
- (4) The provision of a receptacle for coffee besides the cooking kettles.
- (5) Possibility of cooking, or rather relatively speaking keeping the water warm during the march, so that on setting out the cooking pots can be filled with enough for a second meal.
- (6) Enough storage space for a second meal.
- (7) Carriage for the cooking personnel (2 men).
- (8) Carriage for cooking utensils and butcher's tools.

As soon as we are provided with mobile field kitchens, I consider it will be very desirable that they should be used at manoeuvres. Manœuvres should as far as possible resemble real warfare and they should, therefore, also apply to supply arrangements, so that leaders and men may go through a period under service conditions undergoing fatiguing marches and fights and bivouac on the ground according to the general situation. The men should not be fed in billets but from the mobile field kitchens, which march with the 1st Line Transport. Supplies should be collected by purchase or brought up by transport trains. Much could be said about this kind of practice in supply arrangements, but this is outside the scope of this article. I now come to the collection of supplies in the theatre of operations, which General Laymann wishes to leave entirely in the hands of the troops for he states, that the collection and purchase of supplies by the Commissariat Department yields less when carried out by the troops themselves and checks their activity.

General Laymann wishes there to be a sharp distinction between the collection of supplies in the area occupied by the troops as opposed to remote areas. The first is to be exclusively the duty of the troops and the latter that of the Commissariat Department. Such a distinction is quite impossible and can only be regarded as a theoretical proposition put forward by those who are not sufficiently grounded in the principles of our modern Commissariat arrangements.

The collection of supplies by the troops, by purchase and requisition, is neither bound down nor limited by the present regulations and it is in fact demanded in all cases where bivouacking. In practice the procedure is as follows.

If the owners of the houses on which men are banded leave a undertaking the supply of food for the troops, however, then they can be freed from their ration carts and see that these are refilled by purchase and requisition or if these are both impossible, from the supply trains or transport trains. For this purpose the troops have special officers at their disposal, who trust as far as possible to purchase the ration carts, return them to the railway station or to the depot by purchase or requisition. Should it be that these methods are owing to

the exhaustion of the country, then recourse is had to the contents of the army corps supply columns.

Now it would be entirely wrong if these questions of replenishment—by purchase, requisition or supply columns—had to be settled by the supply officer. For this time fails and the probable result would be that the last source—the supply column—could not be tapped owing to it being too far off. Here it is exactly the work of the Commissariat Department which thinking ahead according to the directions of the divisional and corps commanders must explore and work ahead.

How the Commissariat Department can do justice to this task, I will explain below. Normally the work of supply has in any case been fulfilled, as soon as the supply officers have seen, on the troops going into camp, how the rationing and replenishment of supplies will work out until the commencement of operations next day.

The cases in which billeting is possible, will in war be exceptional. Whoever marches with the main body of an army and does not belong to the foremost detachments of the advanced guards, can never count on this. Also purchase and requisition in the immediate theatre of war will soon find a limit. Every one must understand this, who during extensive manoeuvres has ever attempted to purchase supplies from the neighbouring districts. Wherever the masses of troops of the present day may halt, they have the effect of locusts and in a very short time have devoured the last blade of grass. The centre of gravity of supply and its safest support, therefore, always rests in the transport service, for the security of which the Commissariat officers both with the troops and on the line of communications and the representative officials at home co-operate.

Without co-operation between the Commissariat Department and the troops, the supply of the armies of millions of the present day is out of the question. The sphere of work of the Commissariat Department and specially that of the Divisional Commissariat reaches as far as the supply of the battalion, whose supply officer to a certain extent acts as a go-between between the Commissariat Department and the troops. A supply officer who loses connection between the Divisional Commissariat and the troops, or neglects his work, cannot fulfil this difficult task, he is in a false position and must be relieved.

It will perhaps serve to a better understanding and illustrate the method of co-operation, if I sketch shortly what I consider to be the work of the Divisional Intendant and the supply officers, for example, during an advance.

The Divisional Intendant has at his disposal 4 field intendants secretaries, 1 field intendant assistant, and a field supply office with 1 treasurer, 1 controller, and 5 magazine assistants. Out of this *personnel*, he attaches 1 field intendant secretary, 1 field intendant assistant, and the treasurer with 1 magazine assistant to his personal staff. The remainder of the *personnel* are sent out

into the country. The three secretaries have each special bodies of troops assigned to them, to which they ride during the night in order to find out the condition of the supplies and to receive information from the troops.

The controller and the four magazine assistants, however, go ahead, when possible, under cavalry escort, to the theatre of operations pointed out by the Divisional Commander, to investigate the local resources in the district and, if necessary, to make purchases and collect supplies.

The supply officer keeps himself well acquainted with the requirements of the battalion and must, for example, be able to answer the following questions:—

How did the rationing go the day before?

Did the men receive breakfast before starting?

Are the emergency rations complete?

Have the men got any rations with them besides the emergency rations?

What are the contents of the ration and forage waggons?

Have the supplies on the ration carts been replenished?

When therefore the intendants' secretary arrives, the supply officer can give him exact information and make known his requirements. All the information collected by the intendants' secretaries is sent to the Divisional intendant, who is now in a position to make the necessary arrangements at the right time.

An extract of the reconnaissance can then be published in the supply order, which is issued as a divisional order of the day to the troops before they retire to rest.

I should not like it to remain unmentioned that the value and significance of such co-operation is well known to our Commander-in-Chief. Our future efficiency depends on a thorough preparation in peace, which has considerably increased the intelligence for the tasks of the Commissariat Department in war, thanks to the encouragement which the War Ministry and the Chief of the General Staff are continually giving.

I hope to have proved above that the ideal of a good system of supply for the troops does not, as General Layton thinks, depend on a rationalisation of the Commissariat Department's work at the front, on the distant theatre of war, and not on the troops themselves using up the supplies of the theatre of war, as is the case with the distribution of stocks of structures and munitions at the rear, but only on a rational co-operation between the Commissariat Department and the troops.

It is a satisfaction to be reminded, as Kopsch-Göran-Lagerlöf has been, that the military supply of the troops is not a work of the Commissariat Department alone. Here, too, the troops have a responsibility. The troops must have a special institution of their own, who, as they have and have put at their disposal their past

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9. *Battle training.*—It is difficult to place strong organised bodies of artillery into the fight on a narrow front. For this are required a high standard of tactical training, a good eye for country and mutual co-operation in all movements.

10. *Numbers and space on the march.*—Since 1870 the artillery baggage has increased, and thus the army has become more cumbrous, the march of the infantry to the battle field delayed and the mobility of the troops consequently decreased. Attempts must therefore be made to reduce the space occupied by the artillery.

11. *The strength of the Artillery and leadership.*—A commander who brings his army to its objective by means of rapid strokes and great mobility, and understands how to select his battlefield, will be able to do with less artillery than a leader of slower intellect possessing less initiative. An inferior commander will need stronger artillery, while a genius will know how to dispense with its long columns and large amount of baggage.

12. *Conclusion.*—The following may be taken as principles with regard to numbers and space in connection with the employment of artillery:—

(a) The width of the infantry fight determines as a rule the total space available for the artillery.

(b) The employment of this space for placing guns in position is, however, dependent on and consequently limited by the most varied conditions (range of sight, distance, light, accessibility, formation of the ground, cover, etc.).

(c) In order to obtain sufficient room for a proportionally large number of guns, these guns must be fought in several lines (one line firing over those on front). This, however, requires thorough training in peace-time.

FRENCH PAPERS.

(*Revue Militaire Suisse. April, 1907.*)

The main feature of this number is a reproduction of the new Swiss Military law. A short *résumé* of this is accordingly given below.

A commentary on the law in the May and June numbers will also be found briefly summarised in due sequence.

CHAPTER I.

THE NEW MILITARY LAW.

This chapter lays down that every male in Switzerland must either perform personal military service or pay an exemption tax. The age for service is from the 20th to the end of the 48th year.

Besides cases of physical, mental or moral unfitness, which are recognised as debarring a man from the privilege of rendering personal service, certain classes are exempt, such as high civil functionaries, members of the legislature, clergy, medical men, etc.

It may be noted that compensation is given by the State to families left in distress through the absence of the bread winner on military service.

CHAPTER II.

CLASSIFICATION OF THE SWISS ARMY.

This starts with the classification of the Swiss army. There are three divisions, corresponding to the ages of the men who compose them: these are the active army (*élite*), with men of 20 to 32 years of age; and the reserves (*land wehr* and *landstrum*) containing the men of 33 to 40, and 41 to 48, respectively.

In war the three divisions are called out in the order given.

This chapter continues with a description of the composition of the Swiss army, which does not differ materially from other European armies.

Horses are, however, provided on a special system, the expense being shared between the State and the individual, *e.g.*, if the State provides the horse, the man pays half the first cost, and the animal becomes his own property at the end of his *élite* service. Officers are also assisted in obtaining horses.

All arms and personal equipment are furnished by the State. In the case of machines for cyclists the State bears half the cost.

Factories for the manufacture of all descriptions of war-like stores are maintained by the State.

As a rule the soldier is armed and equipped by the canton in which he is recruited, and retains the articles in his possession and at his own risk during the period of his service. He is not permitted to use his equipment for other than military purposes.

The arms and equipment are the property of the Confederation, the individual cannot dispose of the articles. In cases where a man is not capable of looking after his equipment it may be withdrawn.

At the termination of the personal service the man becomes the owner of his arms and equipment.

Officers are provided by the State with arms, equipment and saddlery (in cavalry), and are compensated at a fixed rate for their expenses in purchasing uniform.

The equipment of corps is provided by the State, and stored at the place of assembly. Vehicles are hired.

War reserves of material and explosives are always maintained by the Confederation.

All arms and equipment in the possession of men are inspected annually. The men who are called up for training are inspected during the training; those not called up are inspected on fixed days in the communes. All stores requiring repair or replacement are dealt with on these occasions.

The equipment of corps is inspected every two years, the work being done by their own commanders in the case of infantry and engineers, otherwise by the Military Department. The object of the inspection is to insure that the equipment is properly stored, that there are no deficiencies and that everything is prepared for a rapid mobilisation.

CHAPTER III.

TRAINING OF THE ARMY.

I.—Preparatory Instruction.

The cantonal schools include a regular course of gymnastics as part of the instruction. Public associations continue the boy's physical education after he leaves school, and teach him the use of the rifle. The State exercises a constant and careful supervision over the physical education of the youth of the country up to the time of recruitment for military service. Arms, ammunition, etc., are provided free for the shooting clubs and associations, and other assistance is given as required.

II.—Corps of Instructors.

A regular corps of instructors is maintained for the training of recruits, and for the schools of instruction. The officers of this corps form part of the Army, and receive promotion like other officers.

The training of the troops generally is in the hands of their own officers.

The Military Department decides the general lines of training, and responsible officers work out programmes on these lines. But all schools of instruction must be organised, so that the training may be of a uniform nature. Dates for courses, etc., are arranged so as to present the least possible inconvenience to the exercise of civil duties.

The Federal Polytechnic School has a section for the military sciences, which is intended particularly for officers of the Army, who may desire to extend their military knowledge.

III.—Recruit Training.

The periods of training are :—Infantry and engineers, 65 days; cavalry, 90 days; artillery and fortress troops, 95 days; other services, 60 days.

Specialists, as armourers, buglers, shoeing-smiths, etc., either have special courses and only 40 days' recruit training, or are taught their work during the recruit training.

IV.—Periodical Training.

The *élite* is called out for training every year. The periods are 14 days for artillery and fortress troops, and eleven days for other services. But an individual soldier only attends seven trainings during his term of service (8 in cavalry). Sergeants and senior non-commissioned officers attend ten trainings.

In these trainings manœuvres with small units take place alternately with those of large bodies.

The *landwehr* is called out every four years (except the cavalry) for eleven days' training; but each man below the rank of sergeant performs only one training during his *landwehr* service.

The Federal assembly is empowered to order special trainings as may be required, and also to call out parties from the *landsturm* for three-day courses of a special nature. The Federal Council can also call out the *landsturm* (in certain cases of emergency) for training.

V.—Obligatory and Voluntary Musketry.

Every man who carries a rifle and belongs to the *élite* or the *landwehr*, every non-commissioned officer or subordinate up to and including subaltern officers carries out an annual regulation course. For this purpose private rifle associations, subsidised by the State, are used; similarly, any other club or institution which encourages military knowledge is assisted by the State.

VI.—Training of Non-Commissioned Officers.

Special courses are prescribed before appointment to the non-commissioned ranks.

VII.—Training of Officers.

The commissioned ranks can only be reached through the non-commissioned. Before promotion to a commission the non-commissioned officer undergoes special instruction. The courses are 84

days for infantry, cavalry and fortress troops; 105 days for artillery and engineers; 60 in the train, and 45 for medical, supply and veterinary services.

Officers undergo courses of varying duration before promotion. Further, they are put through musketry training, and tactical and technical courses of instruction as may be necessary.

VIII.—General Staff.

There are three staff courses:—

No. I for future general staff officers.

No. II for captains (42 days).

No. III for officers who have been through Nos. I and II (21 days).

Officers of the general staff go through the training of the staffs to which they happen to be attached. They may also be called upon to undergo special courses like other officers. They are detailed for staff work by roster every year. Railway officers go through a 20 days' course.

IX.—Staff Training.

Staffs are called out every two years for eleven days' tactical training. The course is supervised alternately by the Army Corps and Divisional Commanders. Also every two years exercises in strategy take place. Senior officers such as Divisional Commanders are detailed to take part in these.

X.—Inspections.

All training courses and schools of instruction are inspected by some senior officers according to rules laid down, *e.g.*, a training is inspected by the immediate superior of the officer conducting the training, etc., etc.

CHAPTER IV.

MILITARY ADMINISTRATION.

I.—The Confederation and the Cantons.

The Federal Council carries out the higher military administration through the intermediary of the Swiss Military Department. In the cantons the cantonal authorities carry out the administration under the Confederation. The Federal Council exercises executive control in all matters of duties and exercises, but the rules for the administration are left to the Federal Assembly.

The Federal Council divides the country into military districts, the idea being that a whole division of troops should be recruited in one canton. The canton is further subdivided into districts corresponding to an infantry regiment of the *élite*.

It is the business of the cantons to demand military service of every eligible man living within their limits; and, to assist in the

registration of such men, every permit to drill is reported to the local military authorities. The cantons keep these registers. The military authorities merely maintain lists of units. An officer is told off in each district for the registers of men.

When possible the cantons form their own units complete, *e.g.*, companies, batteries, etc. The Confederation forms certain units also, and details any extra officers, etc., required for the cantons. The cantons appoint their own officers, the Federal Council only appointing staffs, etc., to units formed from several cantons.

The Confederation provides the general equipment and war material, while the cantons furnish the personal equipment of the troops. Complete supplies of all descriptions for an army are always kept ready.

The Federal Assembly indemnifies the cantons for their expenditure on equipment.

The cantons are responsible for the provision and preservation of the equipment for their own troops, so that nothing should be lacking on mobilisation. The Confederation is responsible for the rest of the war material.

The Federal Council lays down the rules for mobilisation, but the work is done in the cantons.

All supplies of provisions, all buildings and works for military purposes are exempt from any local taxes.

II.—Military Administration of the Confederation.

The Chancellery of the Military Department is under the control of the chief of that department. It conducts all correspondence and is in charge of all proposals for submission to the Federal Council. Under it are the heads of the services, *viz.*:—

Chief of the General Staff.

Chiefs of each arm of the service.

Chief Medical Officer.

Chief Intendance Officer.

Chief of the Technical Section, etc., etc.

These chiefs of the various services have the duties of preparing reports, orders, etc., for the annual budget of their arms. They also correspond in the name of the Military Department, and give effect to its decisions.

The General Staff is responsible for the following:

Preparation for war generally.

Mobilisation.

All questions of national defence.

Training of staff and of large units. Organisation and supervision of all schools, and classes of instruction of the staff.

General administration of the General Staff:—

Intelligence.

Military books and maps.

The chiefs of the arms of the service are responsible for:—

Questions relating to their own arm.

Administration of units and their Staff.

Organisation and supervision of training and instruction in units.

Officers (promotion, etc.)

Similarly the chiefs of the non-combatant services.

The following are special:—

Infantry.

Organisation and direction of central schools and musketry.

Cavalry.

Purchase, training and distribution of remounts.

General administration of all questions relating to horses.

Artillery.

Administration and training of troops belonging to the train, and officers' orderlies.

Engineers.

Supervision of Engineer Officer's instruction, supply of explosives and materiel for destructive work, prepares fortifications to be built in time of war.

Fortifications.

Administration and building of permanent fortifications.

Medical.

Administration of the medical charge of the army.

Veterinary.

General supervision of all veterinary work.

Commissariat.

Provision and distribution of food and other supplies. Has charge of all stores for the same. Administers barracks.

Military Technical Section.

Charged with the provision and improvement of war materiel. Manufactures of war stores and proof of guns, etc. Manufacture of ammunition. Hands over completed matériel to the intendance.

Intendance.

Arsenals, storage, and distribution of ordnance, war materiel ammunition, accoutrements, etc., etc., all ordnance duties.

Topographic Section.

Prepares maps, and triangulates.

III.—Command.

The chain of responsibility is intended to give each commander entire control over the command, for which he is responsible. Each commander prepares his troops for war, and may call upon subordinates for reports. Each superior commander makes his reports and proposals for the consideration of higher authority.

A committee of national defence composed of the commanders of army corps, the chiefs of the general staff and the infantry service, under the chief of the Military Department as president, deliberates on all important questions of the defence of the country. As soon, however, as the commander-in-chief is nominated (in war time) this committee ceases to work.

When personal matters are under discussion, such as an officer's promotion, the responsible authorities of the arm of service concerned are allowed to take part in these meetings. Also at least once a year the commanders of army units and certain of the chiefs from the Military Department meet, under the president of the latter, to discuss and propose improvements in the army.

CHAPTER V.

ACTIVE SERVICE.

I.—General Orders.

The army is charged with the duty of defence of the country against foreign aggressors, and the maintenance of order at home.

The army is at the disposal of the Confederation, but, until required by that body, cantons have the power of using their own troops. The expenses of cantonal mobilisation are borne by the canton.

The Federal Council gives orders for the general mobilisation. This order affects every man and officer serving in the troops concerned.

In case of war the Federal Council can call out all men of 19 and 18 who are fit for service, also all employés of the military administration may be brought under military law—including factory hands, etc. Further every citizen who is not called upon to serve in the army, is compelled to place himself at the disposal of the military authorities, and to furnish on requisition any supplies or transport demanded.

II.—Chief Command.

The Federal Assembly nominates the General for chief command when an important mobilisation is contemplated. The Federal Council informs this officer of the object of the operations.

The Chief of the staff is appointed by the Federal Council, on the Chief Commander's recommendation. Up to the time of the General's appointment the command of the army on mobilisation vests in the Military Department.

The General, once appointed, assumes entire control, issues all orders and takes all measures required. He arranges the order of battle, and entrusts to or withdraws from subordinate officers their commands. He requisitions the Federal Council for any further troops necessary.

III.—Horses and Vehicles.

The Confederation has the right to dispose of all means of transport in the country for the mobilisation. Orders may be issued forbidding the export of any animals, (horses, mules, etc.,) and no person may then dispose of any such property.

An indemnity is paid for the use of transport requisitioned for military purposes.

IV.—Railways, &c.

Similarly, all railways and steamship companies are at the disposal of the General in Chief Command in time of war. Once the order is published all the personnel comes under military law and cannot quit the service.

An indemnity is paid to the railways, etc., for the loss due to their employment for war purposes.

May 1907.

The New Military Law.

Considerable opposition has been stirred up against the new law. There is certain to be a referendum.

This article, while admitting these facts, has for its object an exposition of the advantages of the said law.

In 1895 there was also a keen struggle over a question of army re-organisation. The Federalists formed the opposition. The question in dispute was a proposal to transfer all military powers from the cantons to the Confederation, and completely to suppress cantonal troops. The Federal contention, that to deprive the cantons of their interest in all matters military, would inevitably re-act unfavourably on the army, bore weight, and the proposal fell through.

But this time the case is otherwise. There is no interference with constitutional questions, except in the transfer of all that concerns the artillery to the Confederation. And that the consolidation of this arm is an advantage as compared to a system, under which one canton was well provided with gunners, but had no drivers, and *vice versa*, few will deny.

The opposition stirred up in this case is not the work of the Federalists. It is that section of society, who term themselves Socialists, and stand for internationalism in the sense of anti-patriotism, who are responsible. All true lovers of Switzerland should be prepared to stand by a reform, which improves the means of defence of the country.

A frequent complaint against our (Swiss) military authorities has been the introduction of reforms by more or less underhand methods, in that not until the proposal has become an accomplished fact is it made known to the people at large.

On the present occasion, however, no exception can be taken on this score. The first proposals were made in 1903. Numerous committees and conferences were held, and the results thereof published far and wide. The nation was invited to contribute to the discussion, and the invitation was freely accepted. The considerable mass of material which was thus accumulated was laid before the "Longman Conference" in May 1905. The results of these deliberations was the

first draft of the new law. And though the matter has been fully discussed—it was purposely published in both French and German—by the Federal Council, the National Council, etc., and other high authorities, and therefore by the nation, through its elected representatives, the law remains substantially as it was first drafted. It is, therefore, illogical to advance any theories that the nation has not been consulted, and disapproves.

The first advantage of the new law is to establish order in the military legislative system, and to render it clear of comprehension.

The law of 1874 was too wide in its scope, in that it went into the minutest details, and its clauses were couched in such terms that no deviation from the strict letter, and no elasticity in application was possible. The consequent inconvenience has been very great.

The new law benefits by experience. It confines itself to principles, matters of detail being left to constituted authority. It defines the obligations and duties, in a general sense, of the citizen, and the public communities, the *communes*, cantons, Confederation, etc. In regard to military service, it explains the general composition of the army, indicates the object of its existence, and determines the main rules for its administration. Subsidiary laws deal with the military tax, pay, military insurance, and military justice.

The military advantages of the new law consist first and foremost in the unity of the army. The effect of the system hitherto in force has been the creation of several similar but independent armies. It is this that has been corrected. The chain of control and responsibility is so constituted that while the greatest freedom is allowed to the subordinate commanders, the whole are combined in one general system with a centralised administration. Responsibility is in every case conjoined with a liberal exercise of power. Lastly, all training of troops is put into the hands of their own officers.

Again, the present four classes of soldiers are altered into three clearly defined categories: the *élite* men between 20 and 32, the active army in fact—the *landwehr*—33 to 40 the main reserve—, and the *landsturm*—41 to 48, the last line of defence.

Secondary training of troops. The principles on which the law is based are a more complete training of a field army, and a means of keeping second line troops up to the required standard. These ends are attained by lengthening the recruits' training, by annual trainings for the *élite* and by the concentration of the two 5-day *landwehr* trainings in a single 11-day course.

There is little doubt that the change will prove to be of very great value. The *landwehr* course for instance will be a good test of the instructions, acquired in the *élite*.

Next follows the instruction of the various grades. Here the main innovation lies in the institution of a system by which the training of an individual, from the lowest to the highest, becomes continuous throughout his service, beginning with a special N. C. O.'s course for future officers, and ending with the elaborate technical training in strategy prescribed for commanders of divisions of the

army, etc. A direct result will be a greater confidence in themselves on the part of these well instructed officers, and fewer mistakes and therefore more tangible results, at less cost in fatigue to the men, in the training of the troops.

The June number continues with the economic advantages of the law. To begin with, the burden of military service is lightened for the citizen by the fact that all his training is carried out at the opening of his career. After his 27th year he is not called out during his *elite* service. And each year between 20 and 27 the length of the training decreases, from the 77 days of the first to the 11 of the last. Therefore the greater part of the military service is over before the man's time becomes valueable, in that he has to provide for a family. Another result of this is a general decrease in the age of the soldier.

Another advantage is the order under which all inspections of equipment take place during training. This saves the extra time formerly required for the purpose.

A further benefit is the exemption from the military tax at 40 instead of 44, and the clearer orders as to the assistance to be rendered to the families of soldiers.

Another important point is the decrease in the number of possible exemptions from service. This confirms the principle of equality before the law.

Lastly, the encouragement given to military societies, shooting clubs, etc., cannot fail to be of the greatest advantage to the nation.

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THE JOURNAL

OF THE

United Service Institution of India.

Vol. XXXVII.

April 1908.

No. 171.

"MISCHENKO'S RAID ON YINKOW IN JANUARY 1905."

**Being chiefly a translation of the Russian of Colonel
Sveshnikoff, who commanded a Cossack
Regiment in the raid.**

BY CAPTAIN A. W. F. KNOX, 58th VAUGHAN'S RIFLES.

*[Continued from the January number wherein will be found
maps and sketches relating to the raid.]*

**Events of the 4th day,
12th January 1905.**

The column marched punctually at the hour ordered, my regiment in Rear Guard.

Having received an order from General Abramoff to burn some transport captured by our advanced troops, I detailed an officer for the purpose and told my men who were passing the carts at the time to take any oranges and lemons they cared to. I was struck

**A not very serious
shortcoming in the
Cossack character.**

by an unattractive feature in their character. I noticed that many of them took the fruit not with any intention of eating it, but simply prompted by an instinct of bri-

gandage. Numbers of them threw away immediately everything they had taken.

I must confess with sorrow and shame that this was not the first time that I had noticed this trait. Our men are absolutely devoid of any understanding of the private rights of property. Times without number have I seen them, when in want of firewood, neglect to take the wood of buildings already in ruins or even doors, but prefer whatever was nearest at hand, chests of drawers, trunks and small tables.

The midday halt was at the village of Takaunchen, where fresh orders were issued :—

ORDERS.

TAKAUNCHEN :

12 noon, 12th January 1905.

The Chinese report that the enemy, 300 to 1,000 strong, is in occupation of the station of Yinkow, where there are large store depôts.

Order for the attack on Yinkow.

I have decided to attack the station and destroy everything it contains.

To this end :—

1. (a) Composite Force of 19 Sotnias (*detailed from regiments by name*) will leave the midday halting-place at 3 P.M., under command of Colonel Horanoff, march by (*names of village on direct route to Yinkow*) and attack the station in accordance with my special instructions.
- (b) Colonel Shonvaloff's Forces of 5 Sotnias will leave the halting-place at 2 P.M. and march on the Yinkow-Tashichao railway line in accordance with special instructions issued.
2. The Left Column, under General Teleshoff, (20 Sotnias and 12 guns), will march from the halting-place at 3 P.M. on the village Tsianshintsao, before reaching which, it will draw up in preparatory formation on the left side of the high road.
3. The Right Column, under General Samsonoff, (11 Sotnias and 10 guns), will march from the halting-place at 3 P.M. on the village Tsianshintsao, before reaching which it will draw up in preparatory formation on the right side of the road.
4. The Reserve Column under General Abramoff (11 Sotnias) will leave the halting-place at 3-30 P.M. and march on Howenchowdzi, where it will be drawn up in preparatory formation. Communication will be maintained.
5. The Transport Column, under Colonel Sveshnikoff (6 Sotnias), will march in rear of the Reserve Column and form lager at the village of Tumhanfudzi. Communication will be kept up with the Reserve Column.
6. The Field Hospital will be established at Tumhanfudzi.
7. After the night attack columns will re-assemble on the high road between Howenchowdzi and Taxanchen.
8. The plan of operations and pass word will be explained to all the rank and file.
9. I will be with the artillery on the high road.
10. In case of accident to me the command will devolve, first on General Teleshoff and then on General Samsonoff.

(Sd.) GENERAL MISCHENKO.

It was ordered verbally that the guns of the Force should bombard the station for 30 minutes before sunset, (it was actually bombarded for an hour), in order to cause confusion and drive out all the defenders. It was imagined that by the time the bombardment had finished, the storming column would have got close up to the station.

The columns of Count Shouvaloff and Colonel Horanoff were to dismount as many men as possible for the attack and to leave their horseholders as far as possible in rear.

To enable the storming party to find their horses after the attack, the horse-holders were instructed to light bonfires and to enable Colonel Horanoff's column, after the attack, to get quickly from where the horse-holders were to the position of re-assembly, two officers' patrols were detailed, whose business it was to make themselves acquainted with the ground and act afterwards as guides.

The first shots produced great trouble in the railway station and soon a small store house, apparently containing forage, caught fire. Many eye-witnesses hold to the opinion that the Japanese set fire to it themselves, in order to light up the ground to their front. As a matter of fact this fire drew our men towards it and was no small cause of our discomfiture.

On the conclusion of the artillery preparation, Colonel Horanoff's force moved forward to the assault.

The nineteen sotnias were formed in a single firing line under cover of darkness and were ordered to move forward, without firing, to the store houses, setting fire to, and destroying everything in their way.

No precise direction of march was given to the nineteen sotnias, and indeed it would have been difficult to give one in absolute darkness. The men were ordered to march on the fires, but it

An attack by night over unrecognised ground.

must be remembered that there were fires in Daguanshun, in Houfan, in the "Russian Settlement," at the Station and finally in Yinkow. Of course between these fires there were stretches of darkness. It was quite natural that by trying to march on the fires, the men got together into groups and so moved forward.

The firing line was without supports. After moving a comparatively short distance forward, our men were met by volleys from the Japanese Infantry who were waiting us in trenches, protected by military pits and wire entanglements.

As was only to be expected, confusion ensued. Here and there men lay down and opened an irregular fire on an enemy they could not see. Others dashed forward with shouts of "Hurrah."

Three times was the attack renewed, and finally the Japanese were driven back, in spite of the severity of their fire. A party, which succeeded in getting round the obstacles, entered the Russian Settlement, but was there met with volleys from the loop-holes of houses, prepared formerly for defence by our own Frontier Guards.

Another party penetrated to the very Station, but being armed with only rifles and swords was not able to do any serious damage. A few men climbed the telegraph poles and started demolishing the wire, but had not time to carry out their object.

Before the fight, units had been ordered to eventually retire on the horse-holders' bonfires, which should have been in rear of the firing line. Here again there was a misunderstanding. Our doctors and hospital assistants had probably not been warned and so kindled fires in several places to light them in their work of providing first aid to the wounded. The result was that our men, when driven back, found themselves surrounded by fires with no possibility of discovering their proper line of retreat. Many wandered once more into the Japanese entanglements and were raked once more by their fire.

An officer, who took part in the attack, told me that, finding himself absolutely alone a short distance from the Station, he selected a fire to his right to march on and came on to ice. He saw he was wrong, but was quite unable to distinguish our fires, so wandered at hazard, keeping a general northerly direction. He had, however, only succeeded in making his way a few yards when he was fired upon. He finally succeeded in creeping through the wire entanglements under cover of darkness and in reaching one of the ambulance bonfires.

The composite column retired late at night to the high road, after losing a large number of men killed and wounded.

Count Shouvoloff's Column moved out at 2 P.M. as ordered in the direction of the railway. Its task was to cut railway communication and afterwards take part in the attack.

An officer's patrol had been sent forward before it started. Before this patrol had time to reach the railway, it saw a train dart by, crowded with Japanese Infantry. It is said that this train carried at least 700 to 800 men. After it had passed, the patrol succeeded in laying bombs on the line and blowing up the track for a considerable distance. Meanwhile the engine which had brought up the troop train came back, probably bearing Japanese despatches. It ran at a great rate and our guns failed to hit it. Eye witnesses describe how shocking a sight it was when the engine, running at a rate of 60 to 70 miles an hour, came to where the track was broken. There was a dreadful explosion, a huge escape of steam and the locomotive rolled down the bank, completely shattered.

Soon afterwards a second train appeared, full of Japanese Infantry. Count Shouvaloff's column met it with rifle and machine gun fire, but the train continued to move on, the enemy opening fire in reply from the trucks. Before, however, it had reached the gap in the line, the train stopped; Infantry of the strength of about a battalion swarmed out of the trucks, and began to advance by short

rushes on our column, which was gradually forced to retire. Brushing aside Count Shouvaloff's column, the Japanese Infantry moved in a northerly direction which necessitated the detachment of a regiment from the left column as a screen.

Meanwhile it was quite dark by the time I reached the village of Tumhanfudza, which lies at a distance of about a mile from Howenchowdzi, occupied by General Abramoff's Reserve Column.

I had been warned to be prepared for an attack by Japanese Cavalry from the north, so I formed lager and put out outposts facing north.

Meanwhile I received a second message from General Abramoff, reminding me that I should probably be attacked and recommending the utmost caution.

I then reported to General Abramoff as follows:—"I have put out outposts, visiting and reconnoitring patrols have been detailed. I beg you, if possible, to get into touch with me on your flanks, as otherwise there will be gaps. After detailing men for all the various duties required, I have only got three sotnias left. If possible, I beg you to send me two sotnias.

(Sd.) "COLONEL SVESHNIKOFF."

Night had completely fallen and the fighting to the south was at its fiercest, when I received a verbal message from General Abramoff, ordering me to move the Transport, Field Hospitals and Ambulance Stations, where first aid was already in progress, a mile nearer to the Reserve Column. I was then to move all the outposts $\frac{3}{4}$ mile to the south. I was unable to believe this order and wrote back that it seemed to me an unheard of thing to move outposts $\frac{3}{4}$ mile in the middle of the night; that to do this I should have to put out a second line before I withdrew the first, for which I had not enough men, and finally I asked him to repeat the order in writing.

Then a second orderly arrived with an order to fall in the transport and retire to the *North*, as the fight had come to an end. Almost simultaneously came a third galloper, Captain M., with an order, verbal like the first, to move all the transport *South*, $\frac{3}{4}$ mile nearer to General Abramoff's Reserve Column.

I ordered Captain M. to point out where I was to take the transport and told him that I should not let him go until I saw the General himself. It was clear that Captain M. did not know precisely where it was intended I should halt, for he led us $\frac{1}{2}$ to $\frac{3}{4}$ of a mile from our first halting place and then came to a standstill.

Was it worth while breaking up a lager of more than 2,000 horses in the middle of the night in order to move it $\frac{3}{4}$ of a mile? I told the outposts I was moving, but left them where they were.

This was not all. The leading files of the transport had only just reached the new halting-place, when I heard an officer asking for me. The new galloper handed me a *written* order to retire with

all the transport to the village where we had halted at midday, in other words to the north.

At the same moment I received a *written* order from another galloper:—

" $\frac{3}{4}$ of an hour ago I sent a galloper with an order from the Commander of the column for you to march to the village of How-enchowdzi, the galloper tells me of the arrival of another officer cancelling this order. Kindly tell me who this officer was. The O. C. Column has informed the G. O. C. the force that you are moving your lager nearer to us. As we cannot send you more troops, you had better come. Bring the ambulance station with you."

(Sd.) COLONEL MANDRIKO.

(S. O. to General Abramoff).

Here I was with two contradictory orders, both in writing. I searched for mention of the hour of despatch and found this had been omitted in the first order. Luckily just then a general retirement commenced; the fight was over. I turned my transport about and it now blocked the whole road as it was in two lines.

Our retirement from Yinkow was a disorderly rout. The troops got mixed up with the transport, with the wounded, and with the driven cattle of regiments. Sotnias got cut off from their regiments and regiments from their Colonels; the silence of the night was broken by abusive orders and the cries of the transport drivers. So we passed to our bivouac. Through their ignorance of where this bivouac was, many units wandered from the road or took the wrong turning at the cross roads.

The bivouac was at Leksantun.

The 5th Ural Cossack Regiment was sent back to Yinkow with all available stretchers to bring in the wounded of Colonel Horanoff's column.

The regiment trotted back, but, for a long time was unable to find the column in the darkness. Finally, however, it was discovered, chiefly owing to the lanterns by the light of which it was bearing its wounded along. The regiment arrived in the nick of time for the men of the column were dead beat. The wounded were brought into the bivouac at about 8 A.M.

ORDERS.

LEKSANTUN:

Night of the 12—13th January 1905.

To-day's fight showed that there is only a small force of Japanese at Yinkow. The movement of five Japanese

Orders for the 13th January. (See Sketch 7).

battalions from Tashichau is reported. They are supposed to be on the railway line, S. E. of our force. There is no information of the enemy to the north, with the exception of the small force at Newchwang.

The Force marches north on the 13th in order to unite with the right flank of our army.

1. On the left, the column of General Samsonoff will march at 8 A.M. *via (villages)* to Taipintzan where it will halt till 2 P.M.

2. On the right, the column of General Telesheff will march at 8 A.M. by (villages) to Fantsiadapu, where it will halt till 2 P.M.

3. Column of General Abramoff:—

(a) Advanced Guard ... 5 Sotnias.

(b) Main Body ... 12 Sotnias and 16 Guns.

(c) Rear Guard ... 4 Sotnias.

The Advanced Guard will march at 8 A.M.; the main body at 8-15 A.M. The column will march by the high road to Chenchin-thatzi, where it will halt till 2 P.M.

4. The artillery will march two guns abreast: Officers and N. C. Officers of the artillery will be sent forward with the advanced guard to select roads. In narrow places they will look for a way round.

5. Reconnoitring patrols will be sent out:—

(1) From the Verkneudinsky Cossack Regiment to select a suitable place for crossing the River Liao Ho in the neighbourhood of the town of Sanchaho, and (2) from the 5th Ural Cossack Regiment in a southerly direction towards Yinkow. Sketches are required.

6. O. C's units will report before starting on the condition of their commands, having first fallen them in and checked them.

7. I will march at the head of the main body.

8. The Advanced Guard will send patrols out in front.

(Sd.) GENERAL ABRAMOFF.

In addition to those above-mentioned, each column was ordered to send out a patrol to search for crossing places.

I have already stated at the beginning of my notes that the disregard of even such self-evident truths,

Comments.

as,—if a column wants to move rapidly, it must be lightly equipped; if it wants to affect a surprise, it must conceal its movements, or, at all events, forbear to openly discuss the projected raid some two months before it starts,—would not have prevented the raid from bearing brilliant results, if still more rudimentary errors had not been committed.

If it is true that our dilatoriness during the raid (I hesitate to apply this name to our march) was the result of complete misunderstanding of what a raid should be, why did we redouble our effort on the day of Yinkow?

Fortune favoured us. In spite of the ceremonial character of our march, in spite of unnecessary delays, in spite of the wayside skirmishes which we persisted in seeking, and which we could have avoided, we succeeded in reaching Takanouchen, 7 or 8 miles from our main objective, Yinkow. One would have imagined that only one course remained—to march on Yinkow and destroy everything

it contained, but we did something entirely different, we halted for 3 or 4 hours.

And the result of this fatal unnecessary halt was immediately evident, when a whole train load of Japanese troops entered Yinkow unscathed under the very eyes of our advancing columns and still more troops were detrained a few miles off. If we had not halted for three or four hours, 8 miles from Yinkow, but had marched on the town as rapidly as possible, we should have carried out the object set us in our orders and should have destroyed every thing, before the arrival of the Japanese. It would then have been no matter of supreme difficulty to ride away from even a whole Infantry Division.

But we act otherwise; forgetting that one of the chief factors of success in a raid is rapidity of execution; we wait three or four hours and then *attack by night*.

I make bold to remind the reader that preparatory to a night attack, it is well to become fully acquainted with the ground, to get as full information as possible of the enemy, of his dispositions, of the roads leading towards him and of the presence on the reverse of artificial obstacles; further, that the main guarantee of success would appear to be the suddenness, rapidity and accurate launching of the attack.

Did our attack come as a surprise to the enemy?

I maintain it did not. Not to mention the slowness of our march, our wayside fights kept the Japanese fully informed as to our progress. A convincing proof is afforded by the arrival of the Japanese reinforcements and by the fact that the local garrison awaited us in trenches and had occupied the houses prepared for defence in the Russian Settlement. Was it to conceal our purpose of attack that our guns thundered on Yinkow for nearly an hour?

If it be allowed that our march and our proposed attack were known of and expected by the enemy, it must be agreed that having once lost all the advantages of surprise, we had nothing to gain by exposing our operations to all the varied risks of a combat by night. These risks were many. We knew neither the ground, exact number of the enemy, nor the roads leading to his position, and, as a result of our ignorance and the complete darkness, we were unable to launch the attack with the necessary precision of direction. The presence of Japanese Infantry, entrenched behind artificial obstacles, came as a complete surprise, and as is always the case in night operations, a surprise of this kind upsets and spoils the most carefully prepared calculations. Some units lay down; others dashed forward and ran up against houses occupied for defence or delivered their attack on empty space.

Under the actual circumstances, which indeed we might have easily foreseen, we should not have attacked Yinkow by night. On the contrary, we should have shortened our halt, made a dash on Yinkow, finished the matter before it became dark and have crossed the Liao Ho by morning.

However, even granting for the sake of argument, that the night attack was sound, it is difficult to justify the formation, in which it was delivered. Night attacks should be delivered in close formation to facilitate command. Skirmishers should not be sent out. Reserves are essential and should keep closer than usual to the firing line. To eliminate the element of chance, and to avoid coming on the enemy unexpectedly, without first receiving timely reports as to his presence, it is necessary to have a line of scouts.

Our arrangement broke every fundamental rule. The 19 sotnias were drawn out in one long single line, without reserves, and we did not send out scouts.

No one can doubt the splendid bravery of Colonel Horanoff, the Commander of the Composite Column. Still he was a complete stranger to us and was only attached to the force on the eve of the raid. To give him a command, a new command had to be created, and hence the origin of the 'Composite' Column.¹ If a whole Brigade or Division had been detailed, its ordinary commander would of course have retained the command and units would have worked better together under him than was possible in a Composite Column.

The confusion in the transport, arising from the endless contradictory orders, moves and counter-moves, gave the Japanese two splendid opportunities for cavalry attack, first from the rear when we were moving our lager and again at the time of our disorderly retreat to the bivouac. They availed themselves of neither.

Let us examine our position on the night of 12th and 13th January.

As is evident from the attached sketch, the space Dunhean, Yinkow, Tashichao, Haicheng is shut on the N.-W. by the River Liao Ho and a succession of marshes. The latter impassable in summer, were nearly all fordable at the time of the raid.

The River Liao Ho is an obstacle of a different character. It freezes of course, but owing to frequent floods and the saltness of its water, it is never fordable for guns and heavy transport in its lower course, though individuals and even units can manage the passage. The north of the marshes, near Dunhean, the river is passable, thrice averaging from 12½ to 14 inches in the centre, but even here it had to be strengthened artificially under the opposite bank, and in spite of this, when we were crossing, a waggon with wounded went through and was only pulled out with extreme difficulty.

¹ NOTE.—This recalls Lannes' attempt to gain Marbot a brevet by giving him command of a column for an assault on Saragossa, consisting of eight companies of Grenadiers, whose Captains were specially selected because they were junior to him in rank.

It will therefore be seen that only two avenues of retreat were open to me, first to the right bank of the Liao Ho *via* the Narrow Neck near Dunhean, bounded on either side by frozen marshes; secondly, in a more northerly direction.

So much for physical obstacles. As regards the enemy, we knew that five Japanese battalions were on the march from Tashichao on the night of the 12th, 13th January, that two battalions had detrained in Yinkow, and that Haicheng was occupied by 4,000 and Newchwang by insignificant Japanese forces.

From Haicheng to Etabien is $14\frac{2}{3}$ miles.

From Tashichao to Etabien is $16\frac{2}{3}$ miles.

From Newchwang to Etabien is $5\frac{1}{2}$ miles.

What should we have done, if the enemy had taken advantage of our halt at Lianciatun and had moved troops from Haicheng to Etabien to cut us off from the only possible crossing place, and at the same time his five battalions from Tashichao had brought pressure to bear from the south?

It is not contended that the situation was critical. With General Mischenko's great energy and the wonderful luck, which invariably favoured the force, we should of course have cut our way through to the north. Still I maintain that a force, burdened as ours was with a quantity of guns, transport, prisoners and wounded, to the number of 37 officers and 434 rank and file, might have been unnecessarily exposed to danger and hardship. For this reason, it would have been sounder for the force, which had covered less than 20 miles in the whole day, to have continued its march to Dunhean and only to have halted there after placing the obstacle of the River Liao Ho between itself and hostile pursuit.

It is right here to call to mind one measure which was both generally sound and peculiarly fitting to the occasion. As early as the morning of the fight, Chinese spies were openly cross-examined as to the possibility of crossing at places where it was never proposed to cross.

Mistifying and misleading the enemy.

13th January 1905.

In the early morning after a freezing night, an orderly came to me from the staff with instructions to march at 10 A.M. instead of at 8.

The solution of the problem.

Curious to learn the reason of this change, I took an orderly with me and rode over to the headquarters staff. After wandering for some time through the deserted village, I arrived at a large house, before the gates of which the General's flag was visible and a sentry paced up and down. In the courtyard along the house wall lay a whole row of bodies—Cossacks who had died in the night. A Hospital Assistant was occupied in counting the bodies, lantern in hand. One missed the usual morning fuss and hurry, the noise which heralds an early start. Every one hurried through the court frowning, as if annoyed at the sight of these bodies, that no one

wanted, that seemed to have changed the common current of life and to suggest something sad, unnecessary and forbidding. How often have I noticed how our men, when collecting the dead, hasten to cover the face at once and only leave the lower limbs uncovered, because they cannot cover everything. And this is easily understood: a painful feeling of shame and aversion prompts us to shroud the dull, dead glance of reproach of the recently dead. Similarly now, all the faces were covered by matting and only the Hospital Assistant every now and then reluctantly looked at one to check identity.

By 10 A.M. the fallen heroes had been buried in a common grave, the wounded had been bandaged and placed in carts, and the force started on its way to the crossing place.

Our march was unmolested.

On the way reports were received from patrols, who had sighted hostile patrols. According to the Chinese, a force of Japanese, amounting to 4,000 Infantry, Cavalry and Artillery had passed through Newchwang in the early morning on its way from Haicheng. Soon after our start it became known that the crossing at Sanchaho, which had been occupied the previous evening by a small body of cavalry, was now held by a strong force in a defensive position.

On arrival at the halting place, the chief of the staff of the force rode up and handed over a verbal order from General Mischenko to send three Sotnias forward immediately from the advanced guard to seize the crossing at Haichientsan, and prepare it for the passage of guns and transport. Two Sotnias with two guns were sent in support. The ford was found to be unoccupied, so the troops crossed, reconnoitred the further banks and set about strengthening the ice. As, however, Japanese horsemen had been seen on the further bank, the column turned to the left along the river and it was decided to cross at Dunhean.

The darkness became complete. A thick chill mist arose and the squadrons rode along the left bank of the Liao Ho to an accompaniment of creaking artillery and transport wheels.

This was the first crossing by night that I had seen. Discipline was beyond praise. Units moved in loose order, the artillery with long intervals; the one thing desirable was a little less shouting.

The crossing lasted some hours. Finally, when the cold, white mist had quite closed in upon us and the wind was raising clouds of dust we entered Dunhean. All the houses, except a few for the staff, were handed over to the wounded.

The column of General Samsonoff spent a night a short distance to the N.-W. General Teleshoff's column bivouacked N.-E. of Haichientsan, dangerously isolated from the rest of the force.

In the orders of the 13th January the author's regiment was detailed as advanced guard to the centre column, which was to march at 9 A.M. on Shalin. A band of Chinchuses under Tulesan

**Summary of orders for
14th January 1905.**

was reported between the Rivers Han Ho and Liao Ho.

Comments

The author continues—

Putting together all the reports received on the 13th January

Errors of the Japanese

one is forced to the conclusion, that the Japanese really did intend to cut our line of retreat on the line Sanchaho—Newchwang.

What is beyond comprehension is that, while cutting us off to the North, they left one line of retreat to the West quite open, in spite of the fact that there, more than any where, an attempted retreat was to be expected.

While occupying a defensive position at Sanchaho, they left the whole course of the river west of that point absolutely unguarded. Now the Sanchaho was the most unlikely place of all for us to retreat to, and the Japanese should have known this.

1. Our aim was to place the obstacle of the river Lao Ho as far as possible, between ourselves and the enemy. Points on the river west of Sanchaho were nearer to us and so more quickly reached.

2. This crossing is nearer than more westerly crossings, to Newchwang, which we knew to be occupied by the Japanese.

3. The width of the river at Sanchaho is greater owing to the confluence of the two streams.

4. It was undesirable for us to enter an angle of the river, where, if attacked, we might be forced to recross against our will in the presence of the enemy.

On this account it would seem, that the Japanese should have put out a line of observation posts from Sanchaho to Dunchow, and have occupied a central position, say at Hachientsan, to watch the further clearing up of the situation. If they had done this, they would have received warnings from their patrols of the direction of our march and have been able to transfer their force to the threatened point in good time, as from Hachientsan to the furthest possible crossings on either hand is only 2½ to 3½ miles as the crow flies.

It seems that the Japanese made an error in awaiting us on the line Newchwang-Sanchaho and leaving all the western crossings unguarded. If they had occupied the line Newchwang-Lap or Sanchaho, they would have cut off our escape to the N.W., they would have cut us off from all crossing places and have forced us to accept battle at a disadvantage. There can be no question that they could have done this in time. Our first guns were fired at Yinkow at 4.45 P.M. on the 12th January. It is only natural to conclude that when the Japanese despatched troops in trucks to Yinkow, they also made arrangements for cutting our line of retreat. The Chinese reported that 4,000 Japanese marched through Newchwang on the morning of the 14th, and we only started from our bivouac at Lichantsin at 10 A.M. on the 14th and remained till 3 P.M. at the next halting place.

They had abundance of time to move to the west and block our path to the crossings, and that they wished to do so is proved by their occupation of Sanchaho and again by the attack on Gotsu Te-shan on the following day.

14th January 1905.

Events of the 14th January 1905.

The author describes the position of the right column under General Teleshoff by a quotation from the War Diary of the 4th Don Cossack Division:—

Critical position of the Right Column.

“The general principles governing the leading of the right column during the return march from Yinkow were founded on General Mischenko's instructions that the force was to consider itself merely an escort to the transport and wounded and was not to permit itself to be enticed into assuming the offensive.

About 7 p.m. on the 13th January, the column crossed the Liao Ho and went into bivouac in the village of Seenupuchen. At the same time the centre column crossed the river some five miles down stream and General Samsonoff's column about 2 miles still further to the West. Information had been received in the evening that a Japanese battalion was in occupation of a village two or three miles to the north, *i.e.*, on our line of retreat and a report was received in the night that further hostile forces were marching on us from Newchwang.

The position of the column was evidently critical, but nothing could be done to better it during the night. From night-fall on, we were wrapped in an impenetrable mist, which interrupted communication. The complete absence of maps and the refusal of the Chinese guides to lead us in the mist put an end to all idea of moving the bivouac. I, (General Teleshoff), ordered the column to be prepared to defend the village, which was surrounded by a high wall, admirably suited for the purpose. It was only after day light when the fog lighted and enabled the Japanese to shell the village crowded with 2,000 horses that it proved itself a veritable death trap. Early in the morning, a report was received that the Japanese were moving against us from both North and South. The mist began to lift and at dawn I sent out two rear guards, the 19th Regiment and two guns to the South and the 24th Regiment and two guns to the North. The remainder of the column was ordered to evacuate the village and march in a N.-W. direction, the only one still open. The regiment had barely quitted the village when the bombardment began.

The Japanese carried out their attack under the most favourable circumstances imaginable and the position of the column became serious.

The enemy had moved forward by tracks and by paths and as early as the evening before held us in a vice. However, when morning came, the fog enabled our rear guards to open fire suddenly on the Japanese, causing them great loss and driving the southern force beyond the river. Their northern column was literally swept away by shrapnel, hurled upon it from a distance of 1,000 paces, in addition to which its advance guard, a section of infantry, was cut

to pieces by a cavalry charge. In this affair our northern rear guard approached too close to the Japanese main body and suffered considerable loss, the section of the second battery in particular suffering."

Accounts as to details differ, but one is able to gather that this combat was a brilliant example of combined Horse, Artillery and Cavalry work. While engaged in covering the retirement the battery had nearly all its teams killed by the enemy's rifle fire and the guns were saved by cavalry horses.

The author describes how General Mischenko, hearing from a patrol that Teleshov's Right Column was retiring at a trot, pursued by the Japanese, had a plan to cut off the enemy. The wounded and all transport were handed over to the Left Column. General Beimgarten was despatched with two regiments to attack the enemy in flank, the Ural Cossack Brigade was to make a wheel and come in on their rear and General Teleshov was to turn and attack them in front. The plan came to nothing as General Teleshov rode away rapidly across the front of the Centre Column and the Japanese pursuing force, consisting of two cavalry regiments was too weak. Beimgarten's force formed a temporary right flank guard as far as the military halt, when the original order of march was once more resumed.

My description of the raid now draws to a close. From the 15th January we were surrounded by the enemy and retired by short marches to reach the right flank of the main army. General Kiselev, sent to meet us by the Commander in Chief, who had become anxious as to our safety, moved ahead of us.

Why did our enterprise turn out so well? We began well and we finished well. I have just outlined the general strategy of the raid and now I propose to make a more complete sketch. Why is it that the story of this raid, instead of forming a novel and being set page in the history of our cavalry, has become merely an army of scandal to those who took part in it?

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I propose to look at the raid from two points of view. First, as to

Factors of success in a raid. The first factor that strikes the eye is the rapidity of the raid.

1. Choice of the route and the time of preparation.

2. Efficiency of the raiding party.

(a) Preparation of the raid.

How was the raid planned?

Among the first things that I noticed was that I had been told that the raid was planned by the staff of the Commander in Chief.

Want of concealment in preparation. The second factor that strikes the eye is the want of concealment in preparation.

The raid was planned by the staff of the Commander in Chief, and the plan was known to the Japanese. The Japanese were aware of the raid and were prepared to meet it. The raid was a failure.

to pieces by a cavalry charge. In this affair our north flank guard approached too close to the Japanese main body and sustained considerable loss the section of the second battery in particular suffering.

Accounts as to details differ, but one is able to get a fair idea of what this combat was. A brilliant example of combined Horse, Artillery and Cavalry work. While engaged in covering the retreat of the battery had nearly all its teams killed by the enemy's fire, and the guns were saved by cavalry horses.

The author describes how General Mischenko, hearing that patrol that Tel'sheft's Right Column was retiring at a distance of 10 miles, pursued by the Japanese, had a plan to cut off the retreat. The wounded and all transport were handed over to the Right Column. General Baumgarten was dispatched with two regiments to attack the enemy in flank; the Ural Cossack Brigade was ordered to prevent a retreat and come in on their rear and General Tel'sheft was to turn and attack them in front. The plan came to nothing. General Tel'sheft rode away rapidly across the front of the Right Column and the Japanese pursuing force, consisting of two regiments, was too weary. Baumgarten's force formed a strong right flank guard as far as the midday halt, when the original line of march was once more resumed.

My description of the red now draws to a close. From the 15th January, we were untroubled by the enemy and, by short marches, to rejoin the right flank of the main army. General Krasovitsky, sent to meet us by the Commander-in-Chief, who had become anxious as to our safety, moved us out of us.

General criticism.—I have vastly furthered the general strategy of the plan, and I have done so in a most potent fashion. Why, then, do you not say so? Why do you not say that the story of this road, instead of being a new and interesting page in the history of our country, has become merely a minor footnote to those who took part in it?

1. *John F. Kennedy's Leadership in Foreign Wars* ;

Factors of success in a raid

1. C. A. J. Hoeve, *Advances in Protein Chemistry*, 19, 241 (1964).
2. P. D. Bartlett, *J. Biol. Chem.*, 30, 307 (1958).
3. P. D. Bartlett, *Anal. Chem.*, 31, 1615 (1959).

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Want of concealment in preparation

still maintained some appearance of secrecy, several correspondents asked to be attached to the column in order to take part in it. On the 3rd December Colonel Baron K. asked me to use my influence with General Mischenko to get him attached to the column for the raid.

While the Japanese were in the habit of hiding all their plans and even of sending correspondents to the rear, before the commencement of important operations, we used to talk about everything quite openly, in the presence of Chinese. The part played by the Chinese in this war was plain. Under the guise of neutrals they refused us everything and co-operated in every possible way with the Japanese. Everything that we did or said, even our plans for the future, as for example, the time fixed for the second attack on Sandepu, reached the Japanese at once through Chinese and their wonderfully organised system of spies. We took no notice of, even helped, by our carelessness, the leakage of information.

For some unknown reason, it was for a long time generally supposed that the Chinese were our friends and sympathisers and that they helped us against the Japanese. This idea wrought us untold harm. It was only in the second period of the campaign, that some attempt was made to keep them beyond the zone of active hostilities. Up till that time all the orders issued on the subject laid down that they should be well paid and treated in a friendly manner. My personal opinion is that once the war had started, it was rather late to seek the affection of the Chinese; that should have been thought of before.

The Chinaman respects and fears the Japanese, whereas up to date he has only been afraid of us.

The author is of opinion that whereas the Chinese and Japanese are naturally allied races, the Russians had done nothing to earn the love and regard of the former, but everything to deserve their hatred.

He holds the view that the open nature of the Russian character and the slack manner in which foreigners are permitted to see everything there is to see in a Russian barrack, in peace time breed generally slack habits in this respect and make it difficult to keep plans secret in war.

An officer of the Japanese General Staff, who was taken prisoner at Mukden, used to say that he got his most precious information in Port Arthur before the war, by daily visiting a house kept by a certain Miss Mode. Russian officers of all arms used to meet there of an evening and speak out what they thought disregarding the "little Jap."

The author is of opinion that if the Russian officer were trained in peace, as the French and German officer is, to be careful in the keeping of official secrets, he would not speak out his mind in an establishment like Miss Mode's or in the presence of Chinamen, and if he

had reason to believe that a raid was about to come off, he would trumpet forth the fact at every cross road.

He continues: "I now pass to the remaining factors of success in a raid—namely, suddenness and daring in execution."

In speaking of our rate of movement it is necessary to say a few more words about our transport which acted as a brake on the speed of movement throughout the raid. Its organization has been already described.

As a principle, it may be laid down that a raiding force should take with it no transport, either wheeled or pack. Pack transport, especially, lessens the rate of movement and ties the column down. Supplies should be drawn from the local resources of the country.

Hausman in 1814 and Chernshoff in 1813 carried no transport with them, wheeled or pack, but lived entirely on the country.

In the American War, Morgan only very rarely permitted his men to carry food and forage with them. He always counted on obtaining local supplies.

Forrest's men carried with them two or three days' rations—cooked meat and bread or biscuit. When they went on a long raid they were equipped with light carts, carrying a small quantity of food supplies. Stuart's arrangements were similar.

It is to be remembered that the American raids were carried out under very unfavourable circumstances, inhabited points were few and far between, the roads were the worst imaginable, and the bare necessities of life were only obtained with difficulty.

What should we have done in our raid? Should we have taken transport with us or not?

I repeat it was an error to take 1,500 transport animals and dismounted drivers in a column whose success depended entirely on its mobility in a country where everything could be got in a moment. I have already said that the valley of the River Liao Ho is the richest district in Manchuria. In its large villages we could have got forage not only for our force but for one much larger. Transport was so little needed that, as the diary orders prove, none had to be forced to use the supplies it carried. I have described how I saw Chinese troops throw their provisions from the Transport and throw them away after they had gone a few steps. I have also reported General Paderew who was sent shortly before our exit to inquire of the country people that there was more than enough available to feed our force.

At the end of the raid the Chief Transport Officer asked General Mischenko for a receipt for his supplies, the way was clear. The General directed a Staff Officer to go up to the post and find out what had happened to the transport. It was ascertained by the Transport Officer that the transport was lost by the way. The result was that the transport was lost. I have already said that a copy of the diary is being kept.

Articles.			Total quantity carried.	Issued to units.	Consumed by Transport.	Thrown away.
			Maunds.	Maunds.	Maunds.	Maunds.
Biscuit	...	...	630	181	34½	414½
Flour	...	...	90	4½	3½	82
Salt	...	...	45	4½	2½	38
Tea	...	...	7	1½	2	3½
Sugar	...	...	14	8	3	3
Barley	...	...	1,463	617½	144½	701
Total	...	...	2,249	817	190	1,242

(1 maund=82 lbs.)

From this it appears that a smaller proportion of tea, sugar and barley was thrown away, than of the other articles taken.

The men could have carried their tea and sugar without transport and probably quite half of the barley was thrown away by the Cossacks themselves after issue.

If transport was not an indispensable necessity, it was wrong to take it, for it only encumbered the force and made it immobile. More than this it necessitated the constant detachment of a whole regiment as Transport Guard and we were occupied more with its protection generally than with the solving of the problem set us.

The first march showed what a hindrance the transport was certain to prove to rapid movement, and it should have been at once sent back. I suggested this course in my report to the General at the end of the first day's march. As far as I could judge from his reply, it was not in his power to do so.

it contained, but we did something entirely different, we halted for 3 or 4 hours.

And the result of this fatal unnecessary halt was immediately evident, when a whole train load of Japanese troops entered Yinkow unscathed under the very eyes of our advancing columns and so more troops were detained a few miles off. If we had not halted for three or four hours, 8 miles from Yinkow, but had marched to the town as rapidly as possible, we should have carried out the orders set us in our orders and should have destroyed every thing before the arrival of the Japanese. It would then have been a matter of supreme difficulty to ride away from even a whole Infantry Division.

But we act otherwise; forgetting that one of the chief factors of success in a raid is rapidity of execution; we wait three or four hours and then *attack by night*.

I make bold to remind the reader that preparatory to a night attack, it is well to become fully acquainted with the ground, to get as full information as possible of the enemy, of his dispositions, of the roads leading towards him and of the presence on the reverse of artificial obstacles; further that the main guarantee of success would appear to be the suddenness, rapidity and accurate launching of the attack.

Did our attack come as a surprise to the enemy?

I maintain it did not. Not to mention the slowness of our march, our wayside fights kept the Japanese fully informed as to our progress. A convincing proof is afforded by the arrival of the Japanese reinforcements and by the fact that the local garrison awaited us in trenches and had occupied the houses prepared for defence in the Russian Settlement. Was it to conceal our purpose of attack that our guns thundered on Yinkow for nearly an hour?

If it be allowed that our march and our proposed attack were known of and expected by the enemy, it must be agreed that having once lost all the advantages of surprise, we had nothing to gain by exposing our operations to all the varied risks of a combat by night. These risks were many. We knew neither the ground, exact number of the enemy, nor the roads leading to his position, and, as a result of our ignorance and the complete darkness we were unable to launch the attack with the necessary precision of direction. The presence of Japanese Infantry entrenched behind artificial obstacles came as a complete surprise, and as is always the case in night operations a surprise of this kind upsets and spoils the most carefully prepared calculations. Some units lay down, others dashed forward and ran up against houses occupied for defence or delivered their attack on empty space.

Under the actual circumstances which indeed we might have easily foreseen we should not have attacked Yinkow by night. On the contrary we should have shortened our halt, made a dash on Yinkow, finished the matter before it became dark and have crossed the Liao Ho by morning.

However, even granting for the sake of argument, that the night attack was sound, it is difficult to justify the formation, in which it was delivered. Night attacks should be delivered in close formation to facilitate command. Skirmishers should not be sent out. Reserves are essential and should keep closer than usual to the firing line. To eliminate the element of chance, and to avoid coming on the enemy unexpectedly, without first receiving timely reports as to his presence, it is necessary to have a line of scouts.

Our arrangement broke every fundamental rule. The 19 sotnias were drawn out in one long single line, without reserves, and we did not send out scouts.

No one can doubt the splendid bravery of Colonel Horanoff, the Commander of the Composite Column. Still he was a complete stranger to us and was only attached to the force on the eve of the raid. To give him a command, a new command had to be created, and hence the origin of the 'Composite' Column.¹ If a whole Brigade or Division had been detailed, its ordinary commander would of course have retained the command and units would have worked better together under him than was possible in a Composite Column.

The confusion in the transport, arising from the endless contradictory orders, moves and counter-moves, gave the Japanese two splendid opportunities for cavalry attack, first from the rear when we were moving our lager and again at the time of our disorderly retreat to the bivouac. They availed themselves of neither.

Let us examine our position on the night of 12th and 13th January.

As is evident from the attached sketch, the space Dunhean, Yinkow, Tashichao, Haicheng is shut on the N.-W. by the River Liao Ho and a succession of marshes. The latter impassable in summer, were nearly all fordable at the time of the raid.

The River Liao Ho is an obstacle of a different character. It freezes of course, but owing to frequent floods and the saltness of its water, it is never fordable for guns and heavy transport in its lower course, though individuals and even units can manage the passage. The north of the marshes, near Dunhean, the river is passable, thrice averaging from 12½ to 14 inches in the centre, but even here it had to be strengthened artificially under the opposite bank, and in spite of this, when we were crossing, a waggon with wounded went through and was only pulled out with extreme difficulty.

¹ NOTE.—This recalls Laanes' attempt to gain Marbot a brevet by giving him command of a column for an assault on Saragossa, consisting of eight companies of Grenadiers, whose Captains were specially selected because they were junior to him in rank.

It will therefore be seen that only two avenues of retreat were open to me, first to the right bank of the Liao Ho *via* the Narrow Neck near Dunhean, bounded on either side by frozen marshes; secondly, in a more northerly direction.

So much for physical obstacles. As regards the enemy, we knew that five Japanese battalions were on the march from Tashichao on the night of the 12th, 13th January, that two battalions had detrained in Yinkow, and that Haicheng was occupied by 4,000 and Newchwang by insignificant Japanese forces.

From Haicheng to Etabien is $14\frac{3}{4}$ miles.

From Tashichao to Etabien is $16\frac{3}{4}$ miles.

From Newchwang to Etabien is $5\frac{1}{2}$ miles.

What should we have done, if the enemy had taken advantage of our halt at Lianciatun and had moved troops from Haicheng to Etabien to cut us off from the only possible crossing place, and at the same time his five battalions from Tashichao had brought pressure to bear from the south?

It is not contended that the situation was critical. With General Mischenko's great energy and the wonderful luck, which invariably favoured the force, we should of course have cut our way through to the north. Still I maintain that a force, burdened as ours was with a quantity of guns, transport, prisoners and wounded, to the number of 37 officers and 434 rank and file, might have been unnecessarily exposed to danger and hardship. For this reason, it would have been sounder for the force, which had covered less than 20 miles in the whole day, to have continued its march to Dunhean and only to have halted there after placing the obstacle of the River Liao Ho between itself and hostile pursuit.

It is right here to call to mind one measure which was both generally sound and peculiarly fitting to the occasion. As early as the morning of the fight, Chinese spies were openly cross-examined as to the possibility of crossing at places where it was never proposed to cross.

Mistifying and misleading the enemy.

13th January 1905.

In the early morning after a freezing night, an orderly came to me from the staff with instructions to march at 10 A.M. instead of at 8.

The solution of the problem.

Curious to learn the reason of this change, I took an orderly with me and rode over to the headquarters staff. After wandering for some time through the deserted village, I arrived at a large house, before the gates of which the General's flag was visible and a sentry paced up and down. In the courtyard along the house wall, lay a whole row of bodies—Cossacks who had died in the night. A Hospital Assistant was occupied in counting the bodies, lantern in hand. One missed the usual morning fuss and hurry, the noise which heralds an early start. Every one hurried through the court frowning, as if annoyed at the sight of these bodies, that no one

wanted, that seemed to have changed the common current of life and to suggest something sad, unnecessary and forbidding. How often have I noticed how our men, when collecting the dead, hasten to cover the face at once and only leave the lower limbs uncovered, because they cannot cover everything. And this is easily understood; a painful feeling of shame and aversion prompts us to shroud the dull, dead glance of reproach of the recently dead. Similarly now, all the faces were covered by matting and only the Hospital Assistant every now and then reluctantly looked at one to check identity.

By 10 A.M. the fallen heroes had been buried in a common grave, the wounded had been bandaged and placed in carts, and the force started on its way to the crossing place.

Our march was unmolested.

On the way reports were received from patrols, who had sighted hostile patrols. According to the Chinese, a force of Japanese, amounting to 4,000 Infantry, Cavalry and Artillery had passed through Newchwang in the early morning on its way from Haicheng. Soon after our start it became known that the crossing at Sanchaho, which had been occupied the previous evening by a small body of cavalry, was now held by a strong force in a defensive position.

On arrival at the halting place, the chief of the staff of the force rode up and handed over a verbal order from General Mischenko to send three Sotnias forward immediately from the advanced guard to seize the crossing at Haichientsan, and prepare it for the passage of guns and transport. Two Sotnias with two guns were sent in support. The ford was found to be unoccupied, so the troops crossed, reconnoitred the further banks and set about strengthening the ice. As, however, Japanese horsemen had been seen on the further bank, the column turned to the left along the river and it was decided to cross at Dunhean.

The darkness became complete. A thick chill mist arose and the squadrons rode along the left bank of the Liao Ho to an accompaniment of creaking artillery and transport wheels.

This was the first crossing by night that I had seen. Discipline was beyond praise. Units moved in loose order, the artillery with long intervals; the one thing desirable was a little less shouting.

The crossing lasted some hours. Finally, when the cold, white mist had quite closed in upon us and the wind was raising clouds of dust we entered Dunhean. All the houses, except a few for the staff, were handed over to the wounded.

The column of General Samsonoff spent a night a short distance to the N.-W. General Teleshoff's column bivouacked N.-E. of Haichientsan, dangerously isolated from the rest of the force.

In the orders of the 13th January the author's regiment was detailed as advanced guard to the centre column, which was to march at 9 A.M. on Shalin. A band of Chinchuses under Tulesan was reported between the Rivers Han Ho and Liao Ho.

**Summary of orders for
14th January 1905.**

Comments.

The author continues—

Putting together all the reports received on the 13th January, one is forced to the conclusion, that the

Errors of the Japanese.

Japanese really did intend to cut one retreat on the line Sanchaho—Newchwang.

What is beyond comprehension is that, while cutting us off from the North, they left one line of retreat to the West quite open, in spite of the fact that there, more than any where, an attempted crossing was to be expected.

While occupying a defensive position at Sanchaho, they left the whole course of the river west of that point absolutely unobserved. Now the Sanchaho was the most unlikely place of all for us to cross and the Japanese should have known this.

1. Our aim was to place the obstacle of the river Liao Ho, as soon as possible, between ourselves and the enemy. Points on the river west of Sanchaho were nearer to us and so more quickly reached.

2. This crossing is nearer than more westerly crossings to Newchwang, which we knew to be occupied by the Japanese.

3. The width of the river at Sanchaho is greater owing to the confluence of the two streams.

4. It was undesirable for us to enter an angle of the river, where, if attacked, we might be forced to recross against our will in the presence of the enemy.

On this account it would seem that the Japanese should have put out a line of observation posts from Sanchaho to Dunhean and have occupied a central position, say at Haichientsan, to await the further clearing up of the situation. If they had done this, they would have received warnings from their patrols of the direction of our march and have been able to transfer their force to the threatened point in good time, as from Haichientsan to the furthest possible crossings on either hand is only $2\frac{1}{2}$ to $3\frac{1}{2}$ miles as the crow flies.

It seems that the Japanese made an error in awaiting us on the line Newchwang-Sanchaho and leaving all the western roads unguarded. If they had occupied the line Newchwang-Taipientsan, i.e., cut off our escape to the N.-W., they would have cut us off from all crossing places and have forced us to accept battle at a disadvantage. There can be no question that they could have got to this line in time. Our first guns were fired at Yinkow at 4-48 P.M. on the 12th January. It is only natural to conclude that when the Japanese despatched troops in trains to Yinkow, they also made arrangements for cutting our line of retreat. The Chinese too reported that 4,000 Japanese marched through Newchwang on the morning of the 13th and we only started from our bivouac at Liansantin at 10 A.M. on the 13th and remained till 3 P.M. at the midday halting-place.

They had abundance of time to move to the west and block our path to the crossings, and that they wished to do so is proved by their occupation of Sanchaho and again by their attack on General Teleshoff on the following day.

14th January 1905.

The author describes the position of the right column under General Teleshoff by a quotation from the War Diary of the 4th Don Cossack Division:—

Events of the 14th January 1905.

Critical position of the Right Column.

"The general principles governing the leading of the right column during the return march from Yinkow were founded on General Mischenko's instructions that the force was to consider itself merely an escort to the transport and wounded and was not to permit itself to be enticed into assuming the offensive.

About 7 P.M. on the 13th January, the column crossed the Liao Ho and went into bivouac in the village of Seenupuchen. At the same time the centre column crossed the river some five miles down stream and General Samsonoff's column about 2 miles still further to the West. Information had been received in the evening that a Japanese battalion was in occupation of a village two or three miles to the north, i.e., on our line of retreat and a report was received in the night that further hostile forces were marching on us from Newchwang.

The position of the column was evidently critical, but nothing could be done to better it during the night. From night-fall on, we were wrapped in an impenetrable mist, which interrupted communication. The complete absence of maps and the refusal of the Chinese guides to lead us in the mist put an end to all idea of moving the bivouac. I, (General Teleshoff), ordered the column to be prepared to defend the village, which was surrounded by a high wall, admirably suited for the purpose. It was only after day light when the fog lighted and enabled the Japanese to shell the village crowded with 2,000 horses that it proved itself a veritable death trap. Early in the morning, a report was received that the Japanese were moving against us from both North and South. The mist began to lift and at dawn I sent out two rear guards, the 19th Regiment and two guns to the South and the 24th Regiment and two guns to the North. The remainder of the column was ordered to evacuate the village and march in a N.-W. direction, the only one still open. The regiment had barely quitted the village when the bombardment began.

The Japanese carried out their attack under the most favourable circumstances imaginable and the position of the column became serious.

The enemy had moved forward by tracks and by paths and as early as the evening before held us in a vice. However, when morning came, the fog enabled our rear guards to open fire suddenly on the Japanese, causing them great loss and driving the southern force beyond the river. Their northern column was literally swept away by shrapnel, hurled upon it from a distance of 1,000 paces, in addition to which its advance guard, a section of infantry, was cut

to pieces by a cavalry charge. In this affair our northern rear guard approached too close to the Japanese main body and suffered considerable loss, the section of the second battery in particular suffering."

Accounts as to details differ, but one is able to gather that this combat was a brilliant example of combined Horse Artillery and Cavalry work. While engaged in covering the retirement the battery had nearly all its teams killed by the enemy's rifle fire and the guns were saved by cavalry horses.

The author describes how General Mischenko, hearing from a patrol that Teleshoff's Right Column was retiring at a trot, pursued by the Japanese, laid a plan to cut off the enemy. The wounded and all transport were handed over to the Left Column. General Baumgarten was despatched with two regiments to attack the enemy in flank; the Ural Cossack Brigade was to make a circuit and come in on their rear and General Teleshoff was to turn and attack them in front. The plan came to nothing, as General Teleshoff rode away rapidly across the front of the Central Column and the Japanese pursuing force, consisting of two cavalry regiment was too weary. Baumgarten's force formed a temporary right flank guard as far as the midday halt, when the original order of march was once more resumed.

My description of the raid now draws to a close. From the 15th January we were unmolested by the enemy and retired by short marches to rejoin the right flank of the main army. General Koosagoffsky, sent to meet us by the Commander-in-Chief, who had become anxious as to our safety, moved ahead of us.

Why did an enterprise, in itself well conceived, and which might have vastly furthered the general strategical plan, end in a complete fiasco? Why is it that the story of this raid, instead of forming a new and brilliant page in the history of our cavalry, has become merely a memory of shame to those who took part in it?

* * * *

I open the first book I come across on Partisan Warfare and find it stated that the indispensable conditions of success in a raid are :—

Factors of success in a raid.

- (1) Concealment and forethought in preparation ;
- (2) Rapidity and suddenness ; and
- (3) Daring in execution.

How was our raid organised ?

Arranged to take place in January, it was talked about in October, talked about at first as a secret and

Want of concealment in preparation.

then without any pretence at secrecy. I do not think I am wrong in stating that reports appeared in November in more than one paper analysing the advantages of a raid on Yinkow. Before the raid, when Head-quarters

still maintained some appearance of secrecy, several correspondents asked to be attached to the column in order to take part in it. On the 3rd December Colonel Baron K. asked me to use my influence with General Mischenko to get him attached to the column for the rail.

While the Japanese were in the habit of hiding all their plans and even of sending correspondents to the rear, before the commencement of important operations, we used to talk about everything quite openly, in the presence of Chinese. The part played by the Chinese in this war was plain. Under the guise of neutrals they refused us everything and co-operated in every possible way with the Japanese. Everything that we did or said, even our plans for the future, as for example, the time fixed for the second attack on Sandepu, reached the Japanese at once through Chinese and their wonderfully organised system of spies. We took no notice of, even helped, by our carelessness, the leakage of information.

For some unknown reason, it was for a long time generally supposed that the Chinese were our friends and sympathisers and that they helped us against the Japanese. This idea wrought us untold harm. It was only in the second period of the campaign, that some attempt was made to keep them beyond the zone of active hostilities. Up till that time all the orders issued on the subject laid down that they should be well paid and treated in a friendly manner. My personal opinion is that once the war had started, it was rather late to seek the affection of the Chinese ; that should have been thought of before.

* * * * *

The Chinaman respects and fears the Japanese, whereas up to date he has only been afraid of us.

* * * * *

The author is of opinion that whereas the Chinese and Japanese are naturally allied races, the Russians had done nothing to earn the love and regard of the former, but everything to deserve their hatred.

He holds the view that the open nature of the Russian character and the slack manner in which foreigners are permitted to see everything there is to see in a Russian barrack, in peace time breed generally slack habits in this respect and make it difficult to keep plans secret in war.

An officer of the Japanese General Staff, who was taken prisoner at Mukden, used to say that he got his most precious information in Port Arthur before the war, by daily visiting a house kept by a certain Miss Mode. Russian officers of all arms used to meet there of an evening and speak out what they thought disregarding the "little Jap."

The author is of opinion that if the Russian officer were trained in peace, as the French and German officer is, to be careful in the keeping of official secrets, he would not speak out his mind in an establishment like Miss Mode's or in the presence of Chinamen, and if he

had reason to believe that a raid was about to come off, he would not trumpet forth the fact at every cross road.

He continues: I now pass to the remaining factors of success in a raid—rapidity, suddenness and daring in execution.

Want of rapidity in execution. In speaking of our rate of movement, it is necessary to say a few more words about our transport which acted as a brake on all speed of movement throughout the raid. Its organisation has been already described.

As a principle, it may be laid down that a raiding force should take with it no transport either wheeled or pack. Pack transport especially lessens the rate of movement and ties the column down. Supplies should be drawn from the local resources of the country.

Haisman in 1814 and Chernishoff in 1813 carried no transport with them, wheeled or pack, but lived entirely on the country.

In the American War, Morgan only very rarely permitted his men to carry food and forage with them. He always counted on obtaining local supplies.

Forrests' men carried with them two or three days' rations of cooked meat and bread or biscuit. When they went on long raids, they were equipped with light carts carrying a similar quantity of food supplies. Stuart's arrangements were similar.

It is to be remembered that the American raids were carried out under very unfavourable circumstances; inhabited points were few and far between, the roads were the worst imaginable, and the bare necessities of life were only obtained with difficulty.

What should we have done in our raid? Should we have taken transport with us or not?

I repeat it was an error to take 1,500 transport animals with dismounted drivers in a column, whose success depended entirely on its mobility, in a country where everything could be got in abundance. I have already said that the valley of the River Liao Ho is the richest district in Manchuria. In its large villages we could have got forage not only for our force but for one much larger. Transport was so little needed that, as the daily orders prove, men had to be forced to use the supplies it carried. I have described how I saw Cossacks more than once receive rations from the Transport and throw them away after they had gone a few steps. Finally the report of Colonel Plautin, who was sent shortly before our raid to reconnoitre the country proves that there was more than enough available to feed our force.

At the end of the raid the Chief Transport Officer asked General Mischenko for a receipt for supplies thrown away. The General detailed a Staff Officer to go into the question and find out how much was issued to units, how much was consumed by the transport itself, and how much was cast by the wayside. The result was the following table, which I considered it my duty to copy into my note book.

Articles.			Total quantity carried.	Issued to units.	Consumed by Transport.	Thrown away.
			Maunds.	Maunds.	Maunds.	Maunds.
Biscuit	...	...	630	181	34½	414½
Flour	...	...	90	4½	3½	82
Salt	...	...	45	4½	2½	38
Tea	...	...	7	1½	2	3½
Sugar	...	...	14	8	3	3
Barley	...	...	1,463	617½	144½	701
Total	...	...	2,249	817	190	1,242

(1 maund=82 lbs.)

From this it appears that a smaller proportion of tea, sugar and barley was thrown away, than of the other articles taken.

The men could have carried their tea and sugar without transport and probably quite half of the barley was thrown away by the Cossacks themselves after issue.

If transport was not an indispensable necessity, it was wrong to take it, for it only encumbered the force and made it immobile. More than this it necessitated the constant detachment of a whole regiment as Transport Guard and we were occupied more with its protection generally than with the solving of the problem set us.

The first march showed what a hindrance the transport was certain to prove to rapid movement, and it should have been at once sent back. I suggested this course in my report to the General at the end of the first day's march. As far as I could judge from his reply, it was not in his power to do so.

There is no need to touch on the necessity of surprise. Surprise is attained as the natural result of concealment and forethought in preparation and rapidity in execution.

As rapidity of movement is the dominant factor in the success of a raid, I give a table showing our daily marches:—

The distances given are only approximate owing to the difficulty of piecing together several maps of various scales. If anything, however, they are over-estimated.

Table of Marches.

Date.	March.	Distance covered.	Hour of start.	Hour of arrival.	Rate per hour.	Halt.	Pace.
January 9th, '05.	Seefontai-Kaliama-Davan.	22½ miles.	7-30 A.M.	Duration of march never less than 10 to 11 hours.	2½ miles.	None.	Walk.
„ 10th '05.	Davan-Kaliho-Tamitava	22½ miles.	7 A.M.		2½ miles.	1½ hours.	Do.
„ 11th, '05.	Tamitava-Newchwang-Dinziatin.	20½ miles.	7 A.M.		2 miles.	Yes.	Do.
„ 12th, '05.	Dinziatin to Tsianshin-tsao and back to Leksantun.	21½ miles.	8-30 A.M.		2 miles.	4 hours.	Do.
„ 13th, '05.	Leksantun to Dunhean	17½ miles.	10 A.M.		1½ miles.	1½ hours.	Do.
„ 14th, '05.	Dunhean-Shalin-Sadinpa	18½ miles.	9 A.M.		1½ miles.	2 hours.	Do.
	Total distance covered...	123½ miles.	Average rate per hour—2 miles.				

REMARKS.

January 9th—Frost but no wind. Excellent road. No collision with enemy, no delay of any kind.

January 10th—Crossing Hun Ho. Excellent road. Weather good. Two collisions with enemy. The first caused delay, the second did not, as the columns continued their march without interruption.

January 11th—Road and weather excellent. Columns were delayed by the fight at Newchwang, though they took no part in it.

January 12th—Road and weather excellent. Fight at Yinkow.

January 13th—Road and weather excellent. Crossing Liao Ho.

January 14th—Road and weather excellent.

It may be of interest to give the rate of march in a few other raids for purposes of comparison :—

NOTABLE RAIDS.

Cominander, date and place.	Duration of raid.	No. of days halt.	Total distance covered.	Average day's march exclusive of halt.
Chernisheff in 1812 from Slonim to Lepel	5 days	...	233½ miles	46½ miles.
Heisman in 1814 from Lez to Shone ...	13 days	5	200 miles	25 miles.
Stuart in July 1862 near Richmond ...	56 hours.	...	93½ miles	40 miles.
Morgan in July 1862 in Kentucky ...	24 days	3	1 006 miles	48 miles.
Stuart in October 1862 across the Potomac	3 days	...	150 miles	50 miles.
Morgan in 1863 across the Ohio ...	35 hours	...	93½ miles	64 miles.
Burbridge in 1864 in Kentucky ...	30 hours	...	84 miles	67½ miles.
Two Sotnias of the 1st Regiment of Cosacks of the Don from Zamorti to Warsaw in January 1884.	19½ hours	...	76 miles	—
Raid on Yinkow ...	6 days	...	123½ miles	20 miles.

Our dilatoriness arose from the transport, from our unnecessary halts for unnecessary skirmishes, from our system of marching at a walk with a maximum possible pace of 2½ miles an hour and from our frequent and uncalled for halts.

What the uniform pace in a cavalry raid should be, is a matter of some doubt. There are examples in history of brilliant raids carried out at a trot and walk and of equally brilliant ones where the pace was a walk. It would seem, however, that with the splendid roads on which we marched, with the splendid weather, taking into consideration the condition of our horses; and that we had only to cover 123 miles in all, including the retirement from the enemy's sphere, that we should have adopted the more rapid pace. Losses in horse flesh, if such there were, could always have been made good by requisition.

In our wayside fights we committed two errors. We lost time without gaining anything and we drew attention to our march in a quite unjustifiable manner. These frequent collisions with the enemy were the direct result of our unsound system of reconnaissance.

Whereas reconnoitring parties should precede the column by a whole march, ours were only half an hour ahead. Such patrols did not fulfil any object of reconnaissance but merely protected us from

Fights and the consequent delay the result of defective reconnaissance.

unexpected attack. If they had been thrown far ahead, they would have given the force timely warning of the presence of the enemy and have made it possible to avoid unnecessary conflict. Moving, as they did, immediately in front, their warning came too late to be of any use. We had two such unexpected collisions with the enemy on the 10th January. It is true that we knew Newchwang was occupied, but our information came from Chinese and not from our patrols.

It has been already stated that the outposts of the various columns, in spite of the nearness of the bivouac, groped for one another the whole night and only got into touch in the morning, or, if luck favoured them, the flank of one column's outpost line overlapped the flank of another.

This state of things was caused by the lateness of our arrival in bivouac and the necessity of putting our outposts in the dark and without maps. The Sotnias detailed for this duty were generally told to move out 1 to 1½ miles from the bivouac and put out outposts. They were informed what Sotnias would be on their right and left respectively. There being no maps, it was impossible to give them more precise instructions. In this way, one column sent its outposts out a mile, the others, perhaps more, perhaps less, and the error was corrected by patrols which often wandered about all night.

(A number of reports from Sotnia Commanders on outpost duty are quoted which prove the truth of the above description.)

Here, as throughout the war, we were seriously handicapped by the want of good maps. Although we had been in occupation of the country for 10 years, we had not only not troubled to correct the maps but we were absolutely without maps of the country north of Liao-yang, where it was thought we would not fight.

Now could not we really have made good this deficiency when war had become unavoidable? Can it be true that, even after February 1904, when war was declared, we were unable to do some survey work in the districts, which were still in our hands and where we were still masters. Survey officers were indeed sent out from St. Petersburg. A whole year passed and right up to the time of our raid and of the fights at Sandepu, we struggled on as before, that is to say, without a single good map and using in their stead hastily executed and inaccurate road reports.

Still better late than never, and to our general astonishment, a surveyor marched with us on our cavalry raid to make a sketch of the road.

The result of our slackness in this particular had soon become apparent. We find General Stackelberg telegraphing to General Kuropatkin on the 20th October and finishing his message with the words:—"The place where the hills, which stretch away in front of me, should be on the General Staff map, is a blank." At the battle

of Sandepu, the occupation of the suburbs of the town so called was mistaken for the occupation of the town itself. The existence of a lake before Sandepu was unknown, as it was not marked on the map.

Before concluding, I must say a word or two as to the strange disregard of the Japanese railway. Even during our raid, parties were only rarely sent out to carry out demolitions on the line and little importance was attached to their work.

I was struck by the official view on this matter. I happened to be present over when a party was sent off and, strange as it may appear, it was absolutely forbidden to touch important bridges or works on the line and to confine itself merely to temporary damage. The idea was that the line might be used by us later on. How strangely touching is the simplicity of the belief that the Japanese would be as amiable as ourselves and would hand us over everything intact and in good order, when we come to assume the offensive!

The despatch of parties during our raid for the demolition of the line should have been not fortuitous but systematic. From our very start we should have sent out a whole succession of parties, whose object it should have been to fasten here and there on the line and, moving from place to place, under cover of our force, to destroy everything not superficially, but thoroughly.

Our unsuccessful raid gave the Japanese a hint. They made a reconnaissance on the line in our rear and, settling near Tieling and elsewhere, necessitated the detachment of troops to turn them out and caused us much trouble and anxiety.

Note in Conclusion.

The raid was, in Colonel Sveshnikoff's opinion, only a failure because the attack on Yinkow failed. The plan was undoubtedly badly carried out, but was it in itself a great plan?

What should have been Mischenko's objective?

Supposing the attack had been a success, how many hours would Mischenko have spared for the destruction of the stores? It seems clear that he was thinking more of the safety of his rear than of the possibility of a success in front. Otherwise he would have waited till morning and then have tried the fortune of war once more. A success on the night of the 12th would not have robbed of their terror the five Japanese battalions advancing from Tashichao nor the "small force" at Newchwang of its moral power.

But even if the Force had been completely successful in its object and every store in Yinkow had been burned to the ground, before the raiders retired in safety to rejoin their main army, the damage done could have had small strategical effect; Yinkow was not on the main line of communication of the Japanese army. A few extra ship loads would have replaced what had been burnt.

Oyama would not have detached troops from the decisive point on the north, for, simultaneously with the news of the disaster at Yinkow, would have come information of the safe retreat of the Russian Cavalry.

Indeed the attack on Yinkow and the whole conduct of the raid point to the fact that the Russians had exceptional views as to the meaning of such an enterprise. "Perhaps behind everything lay a misty idea, an ill-defined impulse, compelling them to do something somewhere, with their unemployed cavalry."* The idea of appearing in the enemy's rear has a remarkably attractive power for some people. They forget that even on the battlefield, this can have no effect, if unaccompanied by direct tactical onslaught. Similarly mere appearance in the strategical rear can have no influence, unless the channel of supply is actually severed.

An army in the field may be compared to a plant. Its lines of communication are so many roots to supply it with the nourishment, without which, it would cease to exist. If we wish to destroy the plant, it is better to sever the main root than to remove any store of moisture, which might possibly be sucked into a root and so temporarily benefit the plant. Similarly in war it is obviously better to sever the channel by which all supplies must flow, than to destroy a single store depôt at a distance from the front.

If the execution of Mischenko's raid was bad it was no worse than its plan.

His objective should have been the railway, the enemy's main line of communications. Unfortunately the part of the line, exposed to Russian attack, contained no great bridge or tunnel, the mere demolition of which would block the flow of supply long enough to cause inconvenience at the front.

His object should therefore have been to reach the railway with as strong a column as possible and destroy it effectually in as many places as possible;—to establish himself semi-permanently across the enemy's communications, using his mobility to avoid risk when threatened, and to immediately return when danger had passed.

Such an operation, if carried out by a large force of cavalry under a resolute leader and with subordinate officers of initiative and pluck equal to that of the revolutionaries who raid banks in broad daylight in St. Petersburg and Moscow, might have rendered the Japanese lines of communication unsafe for from two to three weeks.†

At the end of that time, shortage of food and ammunition at the front might have forced the enemy to detach largely from the decisive point to get rid of the raiders by elaborate enveloping operations or to protect the line by the establishment of a strong protective cordon along its whole length.

The only excuse for the length of this paper is the importance to us in India of the study of the subject of raids by Cavalry or

* Löffler—"Der Russisch-Japanischen Krieg in seinem taktischen und strategischen Lehren dargestellt"—Part I, page 107.

† Immanuel—"Erfahrungen und Lehren des Russisch-Japanischen Krieges 1904-1905."

mobile Infantry on the railway communications of an enemy in war. Should the great war ever come, which now happily seems unlikely, we, like the Japanese, might find ourselves operating in a country mountainous on the right and of rolling plains on the left.

BUSH-FIGHTING.

(AS EXEMPLIFIED BY SIR J. WILLCOCKS' EXPEDITION TO ASHANTI.)

**A Lecture delivered at the Indian State College on the 31st
July 1907.**

BY LIEUT. C. F. ASPINALL, 1ST ROYAL MUNSTER FUSILIERS.

The type of Bush-fighting about which I propose to speak—

The "Bush."

West African Bush-fighting—is little dealt with in any of our official books; and, until one has seen the country in which it takes place, one has, I think, a somewhat vague idea of the subject. The reason of this seems to be that the very term "Bush" is a misleading one, and fails to give any idea of what the West African variety is like. Nearly every country has what we call "Bush," but in most cases this is nothing but a kind of high scrub jungle, and is as different to the Bush of West Africa as a postage stamp is to a pillar box.

Several books have been written about operations on the West Coast, and one Manual, in particular, deals with the subject, but it always seems to me that the writers of these books lose force from the fact that they do not prepare the mind of their reader by giving him a true picture of what this so-called "Bush" is like—they do not describe the semi-darkness of the forest, and the impenetrable nature of the undergrowth, which prevents you seeing your enemy even when he is only about ten yards away, and which makes a campaign in that country rather like a game of blind man's buff. Before, therefore, proceeding any further, I propose to try and give you a short description of the country, for the benefit of those of you who have not seen it, and to explain what a vast military obstacle the whole forest zone is.

All along the coast of our West African possessions, and for about 250 miles inland, there stretches this huge belt of primeval forest, known to the coaster as "Bush." This forest is composed of three entirely different layers of growth. First of all come the giant cotton trees, whose trunks, some of which are 50 feet in circumference at the base, tower up to a height of 150 feet before a branch is reached. The branches then shoot out at right angles, like an umbrella, and block out nearly all the light. Next come trees of ordinary height, covered with heavy ferns, and tightly interlaced with every sort of creeper; and finally, at the foot of these trees, grows the actual bush itself, a tangle of shrubs and every kind of undergrowth, so matted together with creepers that it is impossible to see ten yards in front of you, or to force your way through it without a sword or a knife.

Through this forest the only means of communication is by the narrow bush paths, which run from village to village, and which are called, for want of a better name, "roads." To avoid swamps and fallen trees, these paths never run straight for more than about 30 yards, and consequently one's view is narrowed down to that extent—a winding path 30 yards or so in front of you, and a thick screen of foliage brushing your coat-sleeve on either side. The width of these paths varies the main roads are perhaps ten feet wide, but the ordinary path is not more than about three; and so rapid is the growth of the bush that unless the path is constantly used, it soon becomes entirely obliterated.

On account of the narrowness of these paths, all columns invariably have to march in single file, about the disadvantage of which I intend to speak later. So used are the natives of the country to this form of progression, that even in the broad streets of a coast town you will see friends going out for a walk together one behind the other. To add to the difficulties of travel in the bush, and to the movements of a fighting column, unbridged rivers are of frequent occurrence, and in many places the road follows the bed of a stream, while in others it runs for miles through a swamp. This is perhaps of no great consequence in the dry season, but in the wet weather during which period the last expedition took place, it increased the difficulties of the Field Force to an inconceivable extent, as columns often had to wade for miles in swamps which reached their waists, and through slime which literally tore the soles off one's boots. The question may be asked, "Why fight in the wet season?" and, of course, except in the case of necessity, one would never do so; but in 1900 it could not be helped.

Having, I hope, given some idea of what the forest is like, I will now give a brief account of the Ashantis who occupy the part of it with which I am, in particular, dealing to-day.

The Ashantis.
As a fighting man the Ashanti is a tough customer, and has always been held in wholesome dread by the tribes who surround his country; but it is, from our point of view, his manner of fighting, rather than his pluck, which makes him dangerous. All is fair in war, and it is only natural that a savage should choose the simplest way of killing his enemy; but to lie in wait for him behind a tree, and then to blaze off at him when he is only ten yards away, and all unconscious of your presence, does not appear to need much more courage than shooting bottles at a fair. The Ashanti is perfectly safe, and can slip away long before the men on each side of his victim have recovered from their surprise, for the bush is not nearly so thick a few yards away from the path as it is close to it, where the constant clearing makes it grow all the faster. He therefore often gets credit for doing a plucky thing, when in reality he has only done a very cheeky one.

To look at, the Ashanti is all gun, for his weapon stands much higher than he does, composed as it is of **Their weapons.** about six feet of old gas piping, with a flint ock and a long straight stock. This weapon is filled pretty nearly up to the muzzle with slugs, pot-legs, chopped-up telegraph wire, etc., and the later you delay the attack, the bigger will be the charge, for the Ashanti keeps up his courage, by filling his gun fuller and fuller while he waits for you.

The gun naturally gives a big "kick" when it is fired, with the result that the tribesmen always fire it from the hip instead of from the shoulder. The consequence of this is that their shots are nearly always "high," which accounts for the comparatively few numbers of casualties they manage to inflict on our columns, as a rule. It is probably the knowledge of this which makes them prefer to make their stand in a dip in the ground rather than on a rise, a curious tendency which was noticed on several occasions during the last campaign.

The above-mentioned gun is the principal weapon of these tribes, but a few modern rifles, spears, and bows and arrows are also used.

It is not intended in this paper to give an account of Sir J. Willcocks' expedition, about which several books have already been written, and I propose to confine myself to trying to bring out some of the lessons with regard to Bush-fighting which it taught.

The first difficulty in West Africa is the question of Transport.

Transport.

As no beast of burden will live in most parts of the bush, everything has to be carried on men's heads, and the difficulties are (i) to get enough carriers, and (ii) to have all the loads about the right weight—60 lbs. With regard to (i) the lack of carriers was a source of great anxiety to the officer commanding in the last expedition, and numbers of them eventually had to be imported from such far away places as Mombassa and Zanzibar.

Looking after the carriers is in itself a difficult task, and a large staff of transport officers, with a knowledge of the native, are required. It has been found that the best plan is to divide them into groups, or battalions, of about 1,000, all from the same tribes, under one of their own chiefs, and to sub-divide these groups into companies of 100 and gangs of 20. Each gang should be placed under a less than usually stupid native, who would be made responsible for the twenty loads carried by his party, and the entire "group" should be under the surveillance of a British transport officer, assisted by two or three N.-C. O.'s. This makes a lot of transport officers necessary, but it adds to the smooth running of a very difficult part of a bush campaign.

In connection with this question of officers it is essential that each fighting unit should have a far larger establishment of them for bush-fighting than for any other campaign. At least four officers per 100 men are advisable, especially for black troops, who will go anywhere so long as they have a white officer, whom they know and whom they can see, to lead them.

Apropos of personnel, it may, I think, be laid down as an axiom that British troops should never be used in West Africa.

The climate is such that they cannot live except in the dry weather, and even then the amount of transport and medical comforts required for them is the greatest handicap to the operations. They were used in the Ashanti Expeditions of 1873-74 and 1895-96, but their presence quite doubled the difficulties of those who had to make the "bundobast" for those campaigns, nor did they do anything which the present black battalions could not do equally well. This was proved in the Expedition of 1900, which consisted entirely of black troops.

From Transport we will turn to the question of Supply. This

Supply.

is a simple thing as far as the West African native is concerned, for all that they require is rice—1½ lbs. per day for a soldier, and 1 lb. for a carrier. It is, however, advisable to give occasional issues of meat when available.

With regard to Europeans, it has been found that the only way to keep them fit in the bush is to give them a very liberal ration, and that it is false economy to try and cut your transport down in that respect. In the early part of Sir J. Willcock's campaign the officers were, of necessity, on very short rations, and the amount of sickness was abnormal. Later on, when the communications to the coast were safe, and convoys from the base could arrive regularly, a most liberal issue was made, and the health of the force improved at once. In addition a medical comfort of a pint of champagne was served out to each European twice a week, and this saved many a life. It is a good plan to issue rations to officers and British N.-C. O.'s in bulk, each week, and to let each officer or N.-C. O. invariably have his ration box, and carrier, with him. In this way he is always ready to go off at a moment's notice on any small column, and also to have his meal on the line of march, wherever his company happens to be in the attenuated column, when a halt is called. Regimental Messes are useless as the unit in West African fighting is a company, and not a regiment.

Turning to the composition of a column in West Africa it

Composition and strength of columns.

is advisable that it should consist of artillery as well as of infantry, both for the moral effect, and also to knock down the enemy's stockades, of which I will speak later.

The organisation of the West African Frontier Force includes several guns, and in the Expedition of 1900 no column, however small, ever went out without being accompanied by at least one gun. This worked well, and ended in the suggestion that each West African regiment should have a gun or guns as part of its armaments. This would appear to be an excellent plan; it would tend to break down the great barriers between the two arms, which begins from the day one cadet goes to Sandhurst and the other to Woolwich; it would teach the infantry that there is after all no great mystery about the sister arm, and would lead to far better mutual understanding and support.

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amount of opposition which is expected in the night column it has been found best for the message to follow in rear of the fighting troops, under a special escort, and to form an independent command, except that it should be in the fighting force at night. In the case of a night column the main body of the column should be in the rear of the main body of the column.

The first rule is to keep the fighting force at night. The second rule is to keep the baggage in front of the main body. The third rule is to keep the baggage in front of the main body. The fourth rule is to keep the baggage in front of the main body. The fifth rule is to keep the baggage in front of the main body. The sixth rule is to keep the baggage in front of the main body. The seventh rule is to keep the baggage in front of the main body. The eighth rule is to keep the baggage in front of the main body. The ninth rule is to keep the baggage in front of the main body. The tenth rule is to keep the baggage in front of the main body.

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It may be of interest to speak about the type of gun used in West Africa. It is a 75 millimetre gun, similar to that supplied by Vickers-Maxim to the C. I. V. Battery in South Africa, the only difference being that the muzzle is several inches shorter, so as to reduce the weight for man transport. The gun fires fixed ammunition, which consists of $12\frac{1}{2}$ lbs. shrapnel and 18 lbs. double common shell. The trail, gun, and cradle are each carried on bamboo frames by four men, while one man is allotted to each wheel, to the axle and to the spare parts, making a total of 16 men for the whole gun. The teams compare very favourably in smartness with the mountain artillery in this country, as even on a narrow slippery bush path, with everything against them, they can come into action in less than $1\frac{1}{2}$ minutes.

In addition to artillery, it is advisable that each company in West Africa should have a Maxim gun. The moral effect of this weapon is exceedingly great, and its value for clearing the bush of the enemy, owing to its power of traversing, is inestimable.

Finally, each soldier must be provided with a machete or *kukri*, with which to cut his way through the bush when scouting, and for "clearing" the bush round the camp each day, an important duty which must never be neglected.

With regard to the strength of a column in Bush-fighting anything over 1,000 fighting men is too unwieldy to use, as the number of carriers required for a force of this size (even with black troops) would be at least 1,500, and this spreads out the column to the inordinate length of anything between 5 and 6 miles. It can, therefore, be laid down that the main column should never consist of more than 1,000 men, or the smaller subsidiary columns of more than from 300 to 500, according to the amount of opposition which is expected.

In the case of a larger column it has been found best for the baggage to follow in rear of the fighting troops, under a special escort, and to form an independent command, except that it should invariably camp with the fighting force at night. In the case of a small force the best place for the baggage is in rear of the main body.

Nothing is more difficult, or needs more experience in bush warfare than the question of the pace that the advanced guard should set. The

Pace.
 numerous obstacles—fallen trees, etc.—on the road continually cause large gaps; and, apparently, no matter how slowly the leading company moves, the rear guard is nearly always running to keep touch. Two rules to remember are that the pace in front should never exceed two miles an hour, and that it should be still further reduced after any obstacle is passed, but the general experience is that, no matter how careful the advanced guard commander may be, he will invariably be abused by the rear guard for hurrying, as soon as they reach camp. Of course, a simple remedy appears to be to keep touch from the rear, but in practice this is very hard to carry out

As to length of march, ten miles is a good day's work in the enemy's country. A start should be made about daybreak (6 A.M.), and a halt of an hour allowed for breakfast about 9 or 10. The men carry their day's rice in their haversacks, and the officers have their "chop" (ration) boxes in their companies, so the order of march is not interfered with, and you eat where you halt.

Camp should never be reached later than 3 or 4, as this gives time to settle down, put out piquets, and clear the bush round the bivouac before night,

which always comes like the pulling down of a blind, about 6 P.M.

For camp a village is generally chosen, as this provides an open space and shelter for the force; and the "clearing" of bush round a village is generally an easy matter, as it usually consists of plantains, etc., all the big trees and jungle having been cut down by the natives to make room for their crops.

It is a good plan to have it laid down in Standing Orders that on arrival in the village fixed for camp, the advanced guard should encamp on, and be responsible for the safety of, the front face, the main body, the flanks, and the rear guard the rear face, the guns being placed in commanding positions on the roads, and the centre of the village left for the baggage.

In the morning the rear guard for the day should invariably relieve the various piquets at daybreak.

If villages are to be burnt by a column, this should always be done on the return march, by the rear guard. If burnt on the outward march

there will be no shelter on the return journey, and if, as has sometimes been done, they are fired by the main body, the rear guard will have an extremely unpleasant time when trying to pass through.

With regard to night marches, I think it may be laid down that they should never be attempted, except in the case of gravest necessity. The risk

is too great. It is impossible to see the man in front of you, and the only means of keeping touch is by holding his coat tails; it can easily be imagined, therefore, that if the enemy did attack, the column would have a very poor chance. At night, too, the carriers generally take the opportunity to loot their loads.

We now come to the actual tactics required in bush fighting.

The natives of the West African Bush may be said to have four different forms of fighting: first, sniping, about which I have already spoken; second,

lying in ambush behind a stockade on the side of the road, a few feet inside the bush; third, the passive defensive, behind a stockade built across the path, with flanks thrown back; and fourth, and most dangerous, what may be called the offensive-defensive, namely, checking the column in front, and then lapping round the flanks, and trying to cut off a part of the force, or to cause a stampede amongst the carriers. No stockade is used by the enemy in this last method of fighting.

Previous to General Willcocks' Campaign the Ashantis had never used stockades; but they are an adaptable race, and having seen and admired

Stockades.

those built by Baden Powell in the 1896 Expedition, they took the lesson to heart, and used the same sort of thing against us on the next opportunity. These stockades were made of a frame work of tree trunks, about 5 feet high and 5 feet thick, the centre being filled up with earth and stones.

In the early part of the campaign under discussion the tribesmen pinned their faith to these flank stockades; and their tactics were to wait

The ambush.

until the advanced guard had filed past, all unconscious, and then to fire into the centre of the column, along the whole length of the stockade. No scouting on the flanks was being done at that time, as the idea was that the thickness of the bush, and the necessity of a speedy advance to the relief of the Governor in Kumasi made it impossible; moreover, these tactics on the part of the enemy were quite unexpected. The result was consequently disastrous, and on one occasion a column of about 350 men and 11 officers lost 7 officers and half its rank and file killed and wounded before they succeeded in extricating themselves.

This forcibly brought home the necessity of scouting on the flanks, no matter how much it delayed the

Scouting in the bush.

columns; and the following was the way it was carried out. At the head of the column marched a point of four men, with rifles loaded. Twenty yards or so in rear came the O. C. leading company of the advanced guard, with half his company; and in the bush, on each side of the path, was a line of about 10 men at 10 paces' interval, cutting their way through the undergrowth with their *kukris*—the officer regulating the pace of the column by the pace these men could manage to progress. Every time a bend in the road was reached, word had to be passed to the scouts to prevent them marching right away from the column.

In addition to these advance flankers, each company down the column would have a man or two out on the flanks, who followed along the tracks made by the men in front.

This scouting was monotonous and trying—the gloom of the forest, the silence in which the work had to be carried out, and the continual anticipation of running against an ambush, all tending to get on to the men's nerves; but it had the effect of searching the bush for 100 yards each side of the column, and practically put an end to sniping and to ambush stockades.

When a flank stockade was met with, however, it was found that the best way to treat it was for the men opposite it to lie down (direct rifle fire was useless) and for one or two of the companies in the rear to be sent into the bush, with a Maxim, to cut their way to the flank and open an enfilade fire. This always had the effect of clearing out the enemy without much difficulty.

The next form of stockade to be dealt with is the one across the path. These are generally built near a village or war camp which the enemy wish to defend, and, in this case, they are always very big works, stretching for some hundreds of yards into the bush on either side of the path, with flanks well thrown back, and protected, perhaps, by smaller flanking stockades; for the West African native fully understands the necessity of guarding against a turning movement.

As soon as the advanced scouts locate this form of stockade, the leading company should at once deploy into both sides of the bush and lie down; the guns should be hurried up to the front, and open fire; while, at the same time, companies in rear should be sent in on each side to get round the flanks. When these latter companies have sent back word that they have gained the flanks (and great care must always be taken that there is no other stockade, still further in the bush, flanking the main one), the "cease fire" should be sounded, and a general charge made down the road and through the breach made by the guns.

The flank companies should charge round the flanks at the same time, and this will generally settle the matter.

We now come to the Ashantis' last method of fighting, the offensive-defensive, which they entirely adopted towards the end of the last campaign, after learning that our gun could so quickly demolish their stockades, and that they could invariably be outflanked.

Their plan, in the latter method, is to check the column with a very heavy fire in front (generally from a position in a dip in the ground, as already stated), and then to sweep round the flanks and try to cause havoc in the weak parts of the column.

Directly it is discovered that there is no stockade, it can be taken for granted that this is what they intend to do and prompt measures must be taken to stop it.

The guns should immediately come into action in front, and, the leading company deploying as before, the second company should right turn and left wheel into the bush, the third company at the same time turning to the left and right wheeling into the bush on the other side of the road, thus making a spearhead formation to the front of the column. These companies should then force back the enemy's flanking parties, being reinforced by the main body companies continuing the line as they come up. The column, meanwhile, closes up to the front, thus reducing its length, and bringing the carriers under the shelter of the companies in the bush.

As soon as the enemy has been forced back from the flanks, and on to the path in front, the "cease fire" must be sounded, and the charge carried out down the path by every available man, drums beating and bugles sounding.

The bayonet is *the* weapon to be used against these tribes, and should invariably be resorted to, but it is most important to

have the "cease fire" taken up by every company before men are sent forward to the charge.

Another point to be observed is that the reinforcing companies on the flanks should be directed very carefully to the outer flanks of the companies already there, and should be warned to hold their fire until they come into line. This all sounds very simple, but, in reality, mistakes can very easily occur in the bush—in one campaign, in particular, a company had fifteen men killed and wounded by a Maxim gun sent forward to reinforce it.

In all Bush-fighting there is the greatest need of decentralization of command. From the nature of the country the column commander can see little of what is going on in other parts, and must trust his subordinates to a very great degree. There is no time to refer for orders, as a rule, and it is next to impossible to change dispositions when once the troops have been launched into the bush.

Lastly the great point to remember in all Bush-fighting is not to give the enemy time to reload his gun, but to charge him with the bayonet as soon as ever you can, and when once you have got him on the run to follow him unceasingly, without giving him time to muster either courage or reinforcements.

The words of Stonewall Jackson are as true in West Africa as anywhere else—"move swiftly, strike vigorously, and secure the fruits of victory."

PERSIA AND THE PERSIAN GULF.

Portions of a Lecture at Bangalore, August 1907.

BY MAJOR E. A. STOTHERD, 30TH LANCERS.

Persia is a country about which the general public knows very little, and it does not therefore receive the attention it deserves. Eastern politics are divided into those of the Near East, comprising chiefly Constantinople and Turkey; the Middle East, Persia and Afghanistan; and the Far East China and Manchuria. In each case we have an ancient kingdom with feeble and corrupt administration, bolstered up and used as a pawn by rival powers. The storm centre of these politics moves from Constantinople to Peking, Peking to Afghanistan, and so on; but more often than people think it is hovering over Persia, and with Persia must be included the Persian Gulf. At Home, and even in India, people are apt to look upon Afghanistan as the crux of the problem, at all events as far as India is concerned: but this is very far from being the case. In Persia it is not merely a question of Russia, but Turkey also comes in; Germany is trying to take a hand with the Mesopotamian Railway and to establish herself on the Gulf, while only a few years ago France attempted to gain a footing and a naval base near Muskat.

It is best first to take a short general survey of the country, its inhabitants and its history.

Its history can be traced back to at least 2,500 years, and in the 7th century B.C. the Medes ruled the whole of the Western Iranian plateau. About 550 B.C.

History.

the Persians led by Cyrus overthrew them and a Medo-Persian Empire was established with powerful rulers such as Cyrus II, Cambyses and Darius. This empire was overthrown in 331 B.C. by Alexander the Great, who further extended his conquests up to the Oxus and Indus. After his death, the country was given over to civil wars and successive invasions and conquests by Parthians, Romans, Turks and Arabs. The modern history of Persia commenced with the rise of the Sufi or Safavi dynasty in 1499 A.D., the greatest ruler of which was Shah Abbas I, who reigned at the beginning of the 17th century. Nadir Shah who usurped the throne a century later was a robber chief from Khorasan. He had most remarkable abilities as a commander, and among his numerous feats of arms was his invasion of India and sack of Delhi.

The Kajar dynasty of which the present Shah is the fifth representative was established in 1779 by Agha Muhammad, son of the Chief of the Turkish Kajar tribe from Astrabad. In 1800 his nephew and successor, Fath Ali Shah, made an alliance with Great Britain, one article of

which was to check the influence of France on the Gulf and open it to British and Indian traders. He later engaged in two unsuccessful wars with Russia, which cost him some of his northern provinces and Russia acquired the right, which she exercises to the present day, of flying her flag supreme on the Caspian which became thenceforth a Russian lake. During the Crimean War the relations of the then Shah, Nasr-ed-din, with Great Britain became strained, and in 1856 he seized Herat from which place he had already been warned off. The Government of India at once declared war on him,

Mohammera.
Karun.
Ahwaz.

Bushire and Mohammera were captured with heavy loss to the Persians, and a naval detachment ascended the Karun river as far as Ahwaz. Persia then agreed to abstain from meddling with Afghan affairs, and the British force withdrew.

Of the greatness of the races of former times and their splendour and civilisation ample testimony is afforded in the present day by numerous ruins of

Ancient ruins.

palaces, temples and cities, in many cases still adorned with magnificent bas-reliefs. To the ordinary traveller these ruins are more interesting than Babylon or Nineveh, which are confused heaps of bricks. The most celebrated of them are to be found some 40 miles north of Shiraz and comprise the former royal city of

Istakhr.
Naksh-i-Rustam.

Istakhr, the fire-altars and royal tombs at Naksh-i-Rustam, and the famous Persepolis, with its rock sepulchres behind. Persepolis according to tradition, was burnt by Alexander the Great, having been built 200 years before. A brief description of this celebrated place as it appears to-day must suffice. There is a platform, 500 yards by 300 yards, built of gigantic slabs of calcareous limestone, varying in height above the plain from 20 to 50 feet; the ground upon which it stands appears to have been terraced from the base of the long ridge of low hills at the back. The summit of the platform is reached by a great flight of steps, so easy in gradient that it is possible to ride up them. On the top, the first thing that meets the eye are two enormous colossi, representing winged bulls; these mark the entrance to the porch of Xerxes, while behind them and to one side rows of shattered columns are all that are left of the Hall of Xerxes and the Hall of the Hundred Columns. Behind these again are the remains of the palaces of Darius and Xerxes, with a number of bas-reliefs, representing feats of arms, still in a wonderful state of preservation. In the hills at the back are rock sepulchres of great interest. Space forbids more than a passing mention of the ruins that still remain, but even in out-of-the-way deserted places, off the main routes, one comes across stone aqueducts that supplied miles of gardens, and foundations of stone-built towns with slabs of stone bearing long inscriptions.

Just south of Lake Niris, at a place called the "forty springs,"

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I came upon such a place; there were traces of great broad streets leading to a central

square, in which was an oval tank of clear water, alive with huge fish, the only living things for miles round.

Further south towards the Gulf, near Firuzabad, are some more little known ruins, which the natives say was an "Atish-keddah" or fire-altar. This appeared to have had an amphitheatre of seats round it. Close beside was a high obelisk built of blocks of stone, and the remains of a Zoroastrian palace, with small chambers and stair-cases in the massive walls. Over one central chamber of this palace, a peculiar domed roof was still intact; it had a circular opening at the top through which the sky could be seen.

The population of Persia is placed at 9,000,000, and of this over two-thirds consist of the Tajiks, as the settled and more civilised Persian-speaking

Population.

lowlanders are called. With them are included the Jews, numbers of whom are scattered all over Persia, and the Armenians who number about 50,000.

Tajiks.

The remainder of the population are classed as nomad; they number about 2,200,000 and consist chiefly of Turks, Turkomans, Kurds and Leks; they also include some 300,000 Arabs

Leks.

who inhabit the lower Karun and shores of the Gulf, and the Lurs, Baluchis, Timuris, and Gypsies. These nomads usually live in tents of black felt made of camel and goat hair. Their wealth consists of horses, flocks and herds; many of

Lurs.

Timuris.

the horses imported to India are bred by them. They owe very little obedience to the Persian Government but are ruled by their own tribal chiefs. They speak dialects of their own, though I have met men among them who could speak Hindustani. These had been with horses to Bombay. They are keen, hardy and brave, but undisciplined and badly armed. A few have breech-loading rifles, but most of them have only long barrelled smooth bores with which, however, they make uncommonly good practice up to 300 yards. They are wonderful scouts and good horsemen, and are always ready for a raid or fight. In fact, if organised, they would make a good fighting force. They shift their camps from high to low ground according to the time of year, and many tribes have houses in their winter quarters, which are left standing empty and deserted during the summer. The nomad is a very much finer man than the ordinary Persian. Many of these nomads, and, especially towards the Gulf, Persians too, are still inclined to look to Britain as their protector, though it is to be feared this feeling is rather shaken nowadays by the want of actual support ever being given them. The Bakhtiars and Arabs certainly hold these sentiments which are worth while fostering and encouraging. I recollect being in Shiraz in 1893, just after the riots, and the telegraph official there told me, a mob of Persians had taken refuge in the British telegraph office, and implored him to telegraph to Queen Victoria, and tell her they placed themselves under her protection. He added that he found the request most embarrassing.

In conclusion it may be added that the British Resident on the Gulf is accepted by all the Arab tribes on the Gulf as their arbiter.

The national religion of Persia is the Shiah form of Muhammadanism; and it must be remembered that there is bitter hatred between the Shiah and Sunni Muhammadans. There are a few Zoroastrians scattered about who still practise the old fire worship of Persia. A creed called Babism was started in 1844, and at the present time, though not openly professed, is rapidly gaining in popularity. It is chiefly directed against the tyranny and fanaticism of the Koran, and laxity of Muhammadanism in Persia. The Babis at various times have been subjected to great persecution. The Bab himself, the originator of the creed, was caught and executed. The meaning of the word Bab is a "gate" or "door."

Persian territory comprises about 700,000 square miles, and occupies the greater portion of the vast Iranian plateau, the altitude of which varies from four to eight thousand feet, and is as it were framed in mountains. On the north the Elburz range, the highest point of which is

Terrain.

Mount Demavend (19,950) whose snow feet-clad peak is visible for many miles when approaching Teheran from the south. The western and southern systems consist of a series of parallel ranges, extending from the Armenian highlands, in a south-easterly direction right on to the Persian Gulf and along its shores to Baluchistan. This general trend of the hills is an important point, having in view the construction of railways or even of mule tracks. Leaving the Gulf one crosses a flat strip of country in places many miles broad with date plantations and then at once begins to ascend the first range of hills; crossing this the tracks descend a little and then again ascend the next parallel range till the central plateau is reached. These ranges are all barren, rocky and treeless, and as a matter of fact, over most parts of Persia one very rarely sees a decent tree. The south side of the Elburz is quite bare; the northern slopes, however, are covered with forests of magnificent trees. Deserts

Deserts.

Dasht-i-Kavir.

Dasht-i-Kavir and Dasht-i-lut (dasht = plain, lut = waterless) follow the trend of the hill ranges and run north-west to south-east for some 500 miles in the very centre of the plateau. They are rightly described as one of the most infernal places on the earth, having no fresh water, great heat and being full of salt quagmires. They practically cut Persia in two, being almost impassable for troops except in very small bodies, following the few existing caravan routes. There are no really great rivers, but the Karun river is most noteworthy, and also the Shatt-el-Arab which gives access to the Tigris, Euphrates and Karun. The

Bandar Nasri.

Karun is navigable to Bandar Nasri, 117 miles, for light draught vessels; rapids here

interrupt, but it is again navigable above these nearly to Dizful.

Dizful.

Messrs. Lynch Bros., an English firm, run steamers on this river. Its importance lies

in the fact that it is probably really the best way for British commerce to penetrate, not only to Isfahan, but also to Tehran.

There are few lakes in Persia, beyond Lake Urymina in the north-west which is 250 miles round, and Lake Niris east of Shiraz. Niris is practically a salt swamp of which so many are found

**Salt Swamps.
Urumiah.**

in Persia, although shown in the map as a sheet of water covering over 200 square miles. When I arrived on the lake shore at the hottest time of year, there was nothing but a dazzling white sheet of salt, with a gleam of water about a mile or two out somewhere near the centre. The slope of the bed is so gradual as to be imperceptible, and consists of sandy loam covered by a saline deposit, which at a short distance from the edge becomes so soft that it is impossible to walk upon it.

Salt marshes or "hamuns" as they are called in Persia abound especially in Seistan. They are formed by water draining into depressions, which have no outlet; the water evaporates leaving deposits. All rivers that drain towards the centre of the plateau lose themselves in the sand and evaporate.

Water in Persia is often brackish and then barely drinkable, and in many places is quite undrinkable. One often comes upon clean running streams of water with fish swimming in them, but as salt as the sea; and it is most unpleasant struggling through a hot toilsome march along the banks of such streams when half dead with thirst.

Persia has every sort of climate from the intense summer heat of the Gulf to the deep snows of the winter in northern higher altitudes.

Climate.

The best times of the year to be there are spring and autumn.

The most notable towns are—Tabriz for its commerce; Kermanshah for trade, breed of horses, grain producing areas, and position at junction of the port of which Enzeli is the principal

Towns.

main routes; Resht the landing place in North Persia; Tehran the capital; Isfahan the ancient capital, still one of the largest commercial centres;

**Enzeli.
Resht.**

Hamadan the ancient Ecbatana, now celebrated for its tanneries; Meshed with a very sacred shrine, situated at junction of several roads, is a trade centre; Shiraz, Yezd, Kerman: and, about the Persian Gulf, the ports of Mohammerah, Bushire, and Bundar Abbas.

Hamadan.

Persian Gulf.

The Persian Gulf is not an attractive spot, its climate is most unhealthy and at some times of the year most unpleasant; supplies and fuel on its shores are scarce, and fresh water often unobtainable. Its ports have chiefly only open roadsteads where vessels have to lie out a

long way, as the foreshores are very flat, especially on the Arabian side, where reefs and shoals also are very bad. Bandar Abbas is important commercially, as it is connected with the interior by five caravan routes. Landing is difficult: large vessels must lie four miles out. It is a dirty place and the climate is so bad that even its own inhabitants as a rule leave it at the worst seasons. The islands of

Ormuz.
Kishm.

Ormuz and Kishm lie off Bunder Abbas and command the entrance to the Gulf, but they are both barren and waterless. At the north-west corner of Kishm is a place called Basidu, which has belonged to Britain since 1820; it is the only territory she possesses in the Gulf, and

Basidu.

was once used as a coal depôt. A British force was camped here in 1820, but the climate was absolutely fatal to them. Ormuz was once owned by the Portuguese, and was then the richest mart in the East, with a city of 40,000 inhabitants and a fort. The whole island is covered with ruins. It does not appear to be known whence their water-supply was obtained. Bushire is the chief seaport of Persia, but it has no harbour, no wharves, no defences; it is the headquarters of the British Resident in the Persian Gulf.

Mohammera is on the north bank of the Hafar Channel connecting the Karun river with the Shatt-el-Arab. Population, about 6,000, mostly Arabs, ruled by a Sheikh under the suzerainty of Persia. This Sheikh used to collect the customs due here, but this is now done by the Shah's officials, and a subsidy allowed him in lieu. On

Koweit.

the Arabian side is Koweit, which possesses a good harbour, though ships of any size have to lie $1\frac{1}{2}$ miles out. It is the port for Nejd, and also for pilgrims to Mecca, but is a desolate place with brackish water.

About half way down the same coast are the Bahrein islands

Bahrein.

famed for their pearl fisheries. The divers follow the most primitive methods, a clothes-pin-like clasp holds the nose, wax protects the ears, while strong claw-like gloves, a basket and a rope of date fibre completes their diving equipment. Sharks are very dangerous to the divers, and the occupation is so injurious to health that few can carry it on long. Bahrein is under British protection, and ruled by an Arab Sheikh. The Arabs here are very fond of sport, the Sheikh Ali bin Isa (not Esau as he has been called, which is a name of no repute among Arabs, while Isa or Jesus ranks as the name of a prophet) used to be a great sportsman, kept about 350 horses, and was always out hunting and hawking gazelles with falcons. Navigation is very difficult off Bahrein owing to the number of reefs, and the water shoals so gradually that even a loaded boat cannot get nearer shore than 200 yards, so the Arabs drive donkeys into the water to carry passengers and cargo to land. The climate is very trying for Europeans in summer, but for half the year it is quite tolerable. The chief trouble is want of good water, and it is most extraordinary that the

best water is procured from fresh water springs in the bed of the sea itself between the two islands. A diver goes down with an empty *mussuck*, fills it at the source of the springs and brings it to the surface ; so naturally water is expensive.

There are various ports on the Arabian Sea, but two are most noteworthy. Chahbar on the Mekran Coast

Arabian Sea.

The water-supply is good : there are landing facilities, and the climate is comparatively cool and healthy. Muskat on the Arabian Coast, ruled by an independent Sultan, is a place of great natural strength, and if put in a state of defence would be impregnable. It has always been under British protection, affords a safe anchorage for British warships and is important as a strong outpost to the entrance of the Persian Gulf.

Muskat.

Except for three or four short roads constructed by foreign enterprise, Persia has no carriage roads ; communication is kept up by rough caravan or mule tracks. The most important routes of these are—

Communications.

- (a) The post route from Bushire to Tehran *viâ* Shiraz and Isfahan, 761 miles ; very difficult as far as Shiraz, owing to steep and rugged passes ; the Indo-European Telegraph line follows this route. Wheel traffic from Isfahan.

- (b) From Mohammera up the Karun river to Bandar Nasri near Ahwaz, where the rapids block the river, thence by a mule road, constructed by the enterprise of Messrs. Lynch Bros., with the co-operation of the Bakhtiari chiefs, to Isfahan. Ahwaz to Isfahan, the land journey, is 277 miles, while

Bakhtiari.

Bushire to Isfahan is 530 miles, and in the former case only one bad *kotal* has to be crossed, impassable in winter. Hopes are entertained that this route will benefit British commerce, but up to date Messrs. Lynch have lost heavily, owing to the unsettled state of the country.

- (c) Another route leaves Ahwaz for Tehran, *viâ* Dizful, Khoramabad, Burujird, Sultanabad to Kuru on the carriage road to Tehran. This

**Khoramabad.
Burujird.**

road is open all the year round and would be of advantage to enable British commerce to penetrate to Tehran and the north. Unfortunately the nomad tribes of Luristan are unruly, and so make the road unsafe. It has been suggested

Luristan.

as a means of getting them in hand to place a fixed sum of money to their credit in the Imperial Bank of Persia, the interest of which would be paid to their chiefs yearly, on condition that the road was kept open and in repair.

- (d) From Basra on the Shatt-el-Arab, up the Tigris to Baghdad, thence entering Persian territory at Khanakin and *via* Kermanshah and Hamadan, to Tehran. This is the easiest road to Tehran and all heavy cumbersome merchandise is sent this way, but traffic by this route is liable to vexatious delays.
- Basra.**
Khanakin.
- (e) From Julfa on the Russian frontier to Tabriz thence to Tehran *via* Kasbin or Hamadan. Russia has a concession for a road to Tehran *via* Tabriz and Kasbin which is being constructed so that a railway can easily be laid when required.
- Julfa.**
- (f) Carriage road constructed in 1899 by a Russian company from Resht to Kasbin and so to Tehran. This is of comparatively little value as a trade route as Enzeli, the Port of Resht on the Caspian, is so bad that only the smallest vessels can enter; the remainder have to lie some way out in an open roadstead, and if the weather, as it generally is on the Caspian, is at all bad, no landing is possible. Frequent cases have occurred of passengers from Baku being taken to and fro several times before being able to get on shore. The road on this account, does not pay commercially, and as the tolls are very high, merchants prefer to use the old mule track over the Elburz, and so avoid paying. If the moneyspent on the road had been devoted to making Enzeli a decent harbour, it would have been far better, but it would not have brought the prestige the road does, and prestige is a strong point in dealing with Asiatics. However, it is a great boon to travellers of the better class between Tehran and Europe.
- Resht.**
Kasbin.
- Baku.**
- (g) Tehran to Meshed *via* Shahrud and Sabzawar is suitable for wheeled transport and is joined to the Russian railway at Ashkabad by a waggon road. Routes lead on from here to Seistan, India and the Persian Gulf.
- Shahrud.**
Sabzawar.
Ashkabad.
- (h) From Quetta to the railhead at Nushki, thence to the Baluchistan frontier at Robat, and so by Seistan to Meshed. This line has been developed by Britain for commercial reasons. It has this advantage over the routes from the south at Bandar Abbas, Chahbar and Gwadur in that it is safe and well patrolled, instead of being infested by gangs of robbers, and avoids the Dasht-i-lut.
- Nushki.**

There are no railways in Persia except a small local line from Tehran to a celebrated shrine just outside the walls.

Railways.

The Persian army is generally described as a badly equipped, badly armed mob, with a nominal strength of 130,000, of which scarcely half would be

Army.

available if required. The men are supposed to spend two out of every three years with the colours. The odd year they spend at their ordinary vocations, but many of them never appear at all, and others evade their obligations by bribery. As an example of how matters are run, an officer commanding say a regiment would, having no qualifications, obtain this appointment by patronage and bribery.

He would then recoup himself by despatching the majority of his men to their villages, and drawing their pay himself, but this is not such a paying business as it sounds, for an infantry private is only paid 27 shillings a year, and other ranks in proportion, and the pay is always in arrears. There is plenty of good fighting material in Persia, but as there is no organisation and no money, it is quite at a discount. The men are armed with old smooth bore muskets, the modern rifles, more to be used in war, being stored in the arsenals. They do no musketry, except in Tehran where they fire about 5 rounds per man per annum. I once met an infantry regiment on the march near Shiraz; they were straggling in twos and threes over about five miles of road, many in ordinary dress, others in a mixture of uniform and plain clothes. Each man had a donkey or mule, which he drove along in front of him, loaded with a tent, bedding, and an old musket; or, if a bandsman, his musical instrument of European manufacture was thus carried.

The sole exception to all this inefficiency is the Cossack Brigade raised in 1879 and trained by Russian officers and non-commissioned officers. It consists of cavalry, artillery and infantry, the cavalry being armed with the Berdan rifle, a sword and a dagger. The artillery have 8·7 cm. Krupp guns, four to a battery. Two or three years ago the strength of the Brigade was—

Russian officers 4; Russian N.-C. O's 8; cavalry 520; infantry 300; artillery 250 with 8 guns; band 70; total 1,149.

Russia insists on these troops receiving their pay regularly. Their headquarters are at Tehran. Their dress is nearly identical with that of the Cossacks of the Russian army and each man provides his own horse. Musketry and artillery training are similar to that prescribed for the Russian army, and the Russian flag flies over their lines.

The irregular cavalry of Persia numbers about 13,600 and is maintained on the old Tartar system of tribal levies. The chief receives a capitation grant *per annum* for which he provides his contingent fully armed, equipped and organised. They are seldom required to serve outside their own districts. The hill tribes, especially the Bakhtiaris and Lurs, would probably provide the best material. The Bakhtiari chiefs *say* they could put 30,000 fighting

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Istakhr
Naksh-e Rostam

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**Lurs
Timuris.**

the horses imported to India are bred by them. They owe very little obedience to the Persian Government but are ruled by their own tribal chiefs. They speak dialects of their own, though I have met men among them who could speak Hindustani. These had been with horses to Bombay. They are keen, hardy and brave, but undisciplined and badly armed. A few have breech-loading rifles, but most of them have only long barrelled smooth bores with which, however, they make uncommonly good practice up to 300 yards. They are wonderful scouts and good horsemen, and are always ready for a raid or fight. In fact, if organised, they would make a good fighting force. They shift their camps from high to low ground according to the time of year, and many tribes have houses in their winter quarters, which are left standing empty and deserted during the summer. The nomad is a very much finer man than the ordinary Persian. Many of these nomads, and, especially towards the Gulf, Persians too, are still inclined to look to Britain as their protector, though it is to be feared this feeling is rather shaken nowadays by the want of actual support ever being given them. The Bakhtiars and Arabs certainly hold these sentiments which are worth while fostering and encouraging. I recollect being in Shiraz in 1893, just after the riots, and the telegraph official there told me, a mob of Persians had taken refuge in the British telegraph office, and implored him to telegraph to Queen Victoria, and tell her they placed themselves under her protection. He added that he found the request most embarrassing.

In conclusion it may be added that the British Resident on the Gulf is accepted by all the Arab tribes on the Gulf as their arbiter.

The national religion of Persia is the Shiah form of Muham-

Religion

madanism; and it must be remembered that there is bitter hatred between the Shiah and Sunni Muhammadans. There are a few Zoroastrians scattered about who still practise the old fire worship of Persia. A creed called Babism was started in 1844 and at the present time, though not openly professed, is rapidly gaining in popularity. It is directed against the tyranny and fanaticism of the Koran, and is of Muhammadanism in Persia. The Babes at various times have been subjected to great persecution. The Bab himself, the originator of the creed, was caught and executed. The meaning of the word Bab is a "gate" or "door."

Persian territory comprises about 700,000 square miles and

Terrain

occupies the greater portion of the vast Iranian plateau, the altitude of which varies from four to eight thousand feet, and is as it were framed in mountains. On the north the Elburz range, the highest point of which is

Demavend

Mount Demavend (19,950) whose snow-crowned peak is visible for many miles when approaching Teheran from the south. The western and southern systems consist of a series of parallel ranges, extending from the Armenian highlands, in a south-easterly direction right on to the Persian Gulf and along its shores to Baluchistan. This general trend of the hills is an important point having in view the construction of railways or even of main tracks. Leaving the Gulf one crosses a flat strip of country in places many miles broad with date palms, etc., and then at once begins to ascend the first range of hills, crossing this the tracks descend a little and then again ascend the next parallel range till the central plateau is reached. These ranges are all barren, rocky and treeless, and as a matter of fact over most parts of Persia one very rarely sees a decent tree. The south-west of the Elburz is quite bare, the northern slopes, however, are covered

Deserts Dasht-i-Kavir

with forests of magnificent trees. The Dasht-i-Kavir and Dasht-i-Ir are an important feature of Persia. The Dasht-i-Ir is a waterless desert with the foot of the Elburz ranges, and runs from west to east for some 100 miles in the very centre of the plateau. They are rightly described as one of the most arid places in the world, having no fresh water, great heat and being almost treeless. They produce very little Persian wheat, being almost impossible to till, except in very small bodies of land, and the few existing oases are small. There are no really great rivers but the Karun rises in the south-west and is the chief Arab watering place to the Fars, Elmand and Kerman. The

Bandar Neft

Karun is navigable to Bandar Neft. The most frequent freight vessels regularly

interrupt, but it is again navigable above these nearly to Dizful.

Dizful.

Messrs. Lynch Bros., an English firm, run steamers on this river. Its importance lies in the fact that it is probably really the best way for British commerce to penetrate, not only to Isfahan, but also to Tehran.

There are few lakes in Persia, beyond Lake Urymina in the north-west which is 250 miles round, and Lake Niris east of Shiraz. Niris is practically a salt swamp of which so many are found

**Salt Swamps.
Urumiah.**

in Persia, although shown in the map as a sheet of water covering over 200 square miles. When I arrived on the lake shore at the hottest time of year, there was nothing but a dazzling white sheet of salt, with a gleam of water about a mile or two out somewhere near the centre. The slope of the bed is so gradual as to be imperceptible, and consists of sandy loam covered by a saline deposit, which at a short distance from the edge becomes so soft that it is impossible to walk upon it.

Salt marshes or "hamuns" as they are called in Persia abound especially in Seistan. They are formed by water draining into depressions, which have no outlet; the water evaporates leaving deposits. All rivers that drain towards the centre of the plateau lose themselves in the sand and evaporate.

Water in Persia is often brackish and then barely drinkable, and in many places is quite undrinkable. One often comes upon clean running streams of water with fish swimming in them, but as salt as the sea; and it is most unpleasant struggling through a hot toilsome march along the banks of such streams when half dead with thirst.

Persia has every sort of climate from the intense summer heat of the Gulf to the deep snows of the winter in northern higher altitudes.

Climate.

The best times of the year to be there are spring and autumn.

The most notable towns are—Tabriz for its commerce; Kerman-

Towns.

shah for trade, breed of horses, grain producing areas, and position at junction of the port of which Enzeli is the principal landing place in North Persia; Tehran the capital; Isfahan the ancient capital, still one of the largest commercial centres;

Hamadan the ancient Ecbatana, now celebrated for its tanneries; Meshed with a very sacred shrine, situated at junction of several roads, is a trade centre; Shiraz, Yezd, Kerman: and, about the Persian Gulf, the ports of Mohammerah, Bushire, and Bundar Abbas.

Hamadan.

The Persian Gulf is not an attractive spot, its climate is most unhealthy and at some times of the year most unpleasant; supplies and fuel on its

Persian Gulf.

shores are scarce, and fresh water often unobtainable. Its ports have chiefly only open roadsteads where vessels have to lie out a

long way, as the foreshores are very flat, especially on the Arab side, where reefs and shoals also are very bad. Bandar Abbas is important commercially, as it is connected with the interior by caravan routes. Landing is difficult: large vessels must not go out. It is a dirty place and the climate is so bad that even the inhabitants as a rule leave it at the worst seasons. The islands

**Ormuz.
Kishm.**

Ormuz and Kishm lie off Bandar Abbas and command the entrance to the Gulf. Both islands are both barren and waterless. At the north-west corner of Kishm is a place called Basidu, which

Basidu.

belonged to Britain since 1820, it is the only territory she possesses in the Gulf. It was once used as a coal depot. A British force was sent here in 1820, but the climate was absolutely fatal to them. Ormuz was once owned by the Portuguese, and was then the richest town in the East, with a city of 40,000 inhabitants and a fortified whole island is covered with ruins. It does not appear to be known whence their water supply was obtained. Bushire is the seaport of Persia but it has no harbour, no wharves, no docks, it is the headquarters of the British Resident in the Persian Gulf.

Mohammeria is on the north bank of the Hajar Channel connecting the Karun river with the Strait of Arab. Population about 10,000. It is an Arab town, ruled by a Sheikh under the suzerainty of Persia. This Sheikh used to collect the customs due here, but this is now done by the British officers, and a subsidy allowed him in return.

Koweit

on the Arab side is Koweit, which possesses a good harbour, though ships of any size have to lie 1½ miles out. It is the port for Nejd, and also for pilgrims to Mecca, but is a desolate place with brackish water.

About half way down the same coast are the Bahrein islands, famous for their pearl fisheries. The natives follow the most primitive methods of catching

Bahrain

pearls, and spend the most of the year picking the oysters with sticks, cracking, giving a twist and a rap of the thumb, comparing the diving equipment. Sticks are very dangerous to the divers, as the pearls are so small that it is difficult to find them. The large pearls are sold for the highest price, and are sold by an Arab Sheikh. The Arabs are very fond of sport, the Sheikh of Bahrain is famous for his hunting, which is a kind of horse racing. Among Arabs, a horse is called a *shams*, a name of a prophet, as to be a great sportsman is a point of honour. He was always hunting with his dogs, with his sons. Navigation is very difficult, the Bahrein islands are a kind of a net, and the water is very shallow, so the Arabs drag their boats into the water to pass, as it is very difficult. The climate is very trying for Europeans in summer, but for half the year it is quite tolerable. The chief trouble is want of good water, and it is most extraordinary that the

best water is procured from fresh water springs in the bed of the sea itself between the two islands. A diver goes down with an empty *mussuck*, fills it at the source of the springs and brings it to the surface ; so naturally water is expensive.

There are various ports on the Arabian Sea, but two are most noteworthy. Chahbar on the Mekran Coast important as routes lead inland from it.

Arabian Sea.

The water-supply is good: there are landing facilities, and the climate is comparatively cool and healthy. Muskat on the Arabian Coast, ruled by an independent Sultan, is a

Muskat.

place of great natural strength, and if put in a state of defence would be impregnable. It has always been under British protection, affords a safe anchorage for British warships and is important as a strong outpost to the entrance of the Persian Gulf.

Except for three or four short roads constructed by foreign enterprise, Persia has no carriage roads; communication is kept up by rough caravan

Communications.

or mule tracks. The most important routes of these are—

(a) The post route from Bushire to Tehran *via* Shiraz and Isfahan, 761 miles; very difficult as far as Shiraz, owing to steep and rugged passes; the Indo-European Telegraph line follows this route. Wheel traffic from Isfahan.

(b) From Mohammera up the Karun river to Bandar Nasri near Ahwaz, where the rapids block the river, thence by a mule road, constructed by the enterprise of Messrs. Lynch Bros., with the co-operation of the Bakhtiari chiefs, to Isfahan. Ahwaz to Isfahan, the land journey, is 277 miles, while Bushire to Isfahan is 530 miles,

Bakhtiari.

and in the former case only one bad *kotal* has to be crossed, impassable in winter. Hopes are entertained that this route will benefit British commerce, but up to date Messrs. Lynch have lost heavily, owing to the unsettled state of the country.

(c) Another route leaves Ahwaz for Tehran, *via* Dizful, Khoramabad, Burujird, Sultanabad to Kuru on the carriage road to Tehran. This

**Khoramabad.
Burujird.**

road is open all the year round and would be of advantage to enable British commerce to penetrate to Tehran and the north. Unfortunately the nomad tribes of Luristan are unruly, and so make the road unsafe. It has been suggested

Luristan.

as a means of getting them in hand to place a fixed sum of money to their credit in the Imperial Bank of Persia, the interest of which would be paid to their chiefs yearly, on condition that the road was kept open and in repair.

- (d) From Basra on the Shatt-el-Arab, up the Tigris to Baghdad, thence entering Persian territory at Khuzistan and *via* Kermanshah and Hamadan, to Tehran. This is the easiest road to Tehran and all heavy cumbersome merchandise is sent this way, but traffic by this route is liable to vexatious delays.
- (e) From Julfa on the Russian frontier to Tabriz thence to Tehran *via* Kasbin or Hamadan. Russia has a concession for a road to Tehran *via* Tabriz and Kasbin which is being constructed so that a railway can easily be laid when required.
- (f) Carriage road constructed in 1899 by a Russian company from Resht to Kasbin and so to Tehran. This is of comparatively little value as a trade route as Enzeli, the Port of Resht on the Caspian, is so bad that only the smallest vessels can enter, the remainder have to lie some way out in an open roadstead and if the weather, as it generally is on the Caspian, is at all bad, no landing is possible. Frequent cases have occurred of passengers from Baku being taken to and fro several times before being able to get on shore. The road on this account, does not pay commercially, and as the tolls are very high, merchants prefer to use the cart-track over the Elburz and so avoid paying. If the money spent on the road had been devoted to making Enzeli a decent harbour, it would have been far better but it would not have brought the prestige the road does, and prestige is a strong point in dealing with Asiatics. However, it is a great boon to travellers of the better class between Tehran and Europe.
- (g) Tehran to Meshed *via* Shahrud and Sabzawar is suitable for wheeled transport and is joined to the Russian railway at Ashkhabad by a wagon road. Routes lead on from here to Seristan, India and the Persian Gulf.
- (h) From Quetta to the railhead at Nushki, thence to the Baluchistan frontier at Robat and so by Seristan to Meshed. This route has been developed by Britain for commercial reasons. It has this advantage over the routes from the south at Bandar Abbas, Chahbar and Gwadar in that it is safe and well patrolled instead of being infested by gangs of robbers, and avoids the Dasht-i-lut.

There are no railways in Persia except a small local line from Tehran to a celebrated shrine just outside the walls.

Railways.

The Persian army is generally described as a badly equipped, badly armed mob, with a nominal strength of 130,000, of which scarcely half would be available if required. The men are supposed to spend two out of every three years with the colours. The odd year they spend at their ordinary vocations, but many of them never appear at all, and others evade their obligations by bribery. As an example of how matters are run, an officer commanding say a regiment would, having no qualifications, obtain this appointment by patronage and bribery.

Army.

He would then recoup himself by despatching the majority of his men to their villages, and drawing their pay himself, but this is not such a paying business as it sounds, for an infantry private is only paid 27 shillings a year, and other ranks in proportion, and the pay is always in arrears. There is plenty of good fighting material in Persia, but as there is no organisation and no money, it is quite at a discount. The men are armed with old smooth bore muskets, the modern rifles, more to be used in war, being stored in the arsenals. They do no musketry, except in Tehran where they fire about 5 rounds per man per annum. I once met an infantry regiment on the march near Shiraz; they were straggling in twos and threes over about five miles of road, many in ordinary dress, others in a mixture of uniform and plain clothes. Each man had a donkey or mule, which he drove along in front of him, loaded with a tent, bedding, and an old musket; or, if a bandsman, his musical instrument of European manufacture was thus carried.

The sole exception to all this inefficiency is the Cossack Brigade raised in 1879 and trained by Russian officers and non-commissioned officers. It consists of cavalry, artillery and infantry, the cavalry being armed with the Berdan rifle, a sword and a dagger. The artillery have 8·7 cm. Krupp guns, four to a battery. Two or three years ago the strength of the Brigade was—

Cossack Brigade.

Russian officers 4; Russian N.-C. O.'s 8; cavalry 520; infantry 300; artillery 250 with 8 guns; band 70; total 1,149.

Russia insists on these troops receiving their pay regularly. Their headquarters are at Tehran. Their dress is nearly identical with that of the Cossacks of the Russian army and each man provides his own horse. Musketry and artillery training are similar to that prescribed for the Russian army, and the Russian flag flies over their lines.

The irregular cavalry of Persia numbers about 13,600 and is maintained on the old Tartar system of tribal levies. The chief receives a capitation grant *per annum* for which he provides his contingent fully armed, equipped and organised. They are seldom required to serve outside their own districts. The hill tribes, especially the Bakhtiaris and Lurs, would probably provide the best material. The Bakhtiari chiefs *say* they could put 30,000 fighting

men in the field, and of these 7,000—8,000 would be well mounted and armed with Martini rifles; but ammunition is very scarce.

The Persian navy consists of a small obsolete gunboat called the "Persepolis," which is stationed on the Gulf; a small river steamer, and two yachts. The

Navy.

Russians do not allow the Persian flag to be flown on the Caspian.

The general condition of Persia may be summed up as follows.

General condition of Persia.

The country is becoming rapidly bankrupt, and foreign nations are her creditors. The Shah and court are recklessly extravagant. The revenue is frittered away on pleasures and excesses; there is scarcely a farthing spent on public works or improvements. All public appointments are secured by patronage and bribery, and their holders recoup themselves for the outlay, necessitated by this system, by extortion in turn from those under them, so it falls finally on the people who are impoverished, ground down, and discontented. Most of the country is a desert, whereas a progressive Government would arrange for storage of the tons of water from rains and melting snows, which are allowed to run to waste instead of turning the country into a mass of cultivation.

As regards trade, that from the north is fostered by Russia in a systematic and far-seeing manner, being encouraged by premiums and advertised by glowing returns; though obviously bounty-fed trade is apt to collapse. From the south and east the British trade comes in; and, in spite of the handicaps it has to contend with in the way of bad communications and other difficulties, it still makes its way, and is not really in the hopeless condition some people would like to make out. It would be a great pity if the idea took root that British trade is practically extinct, and therefore not worth troubling about. The Persian customs are now administered by Belgian officials, so chosen because Belgium is a small neutral country, which has no interests in Persia. The old trade tariff used to be a single 5 per cent *ad valorem* duty leviable alike on all imports and exports; for this has been substituted a new tariff, nominally the same for all nations, but all recent writers seem to think that British goods lose by it heavily in comparison with Russian.

The regeneration of Persia can only be brought about by improved communications, and it would appear that the construction of railways is the key of the situation; but existing conditions prevent this. In 1890 the then Shah bound himself with Russia not to allow any railways to be constructed in Persia for ten years; this period has been extended, it is believed, for another ten years. In Trans-

Caucasia.

Caucasia, Russia has extended her railway up to Julfa on the frontier, and also has a concession for a road to Tabriz so constructed that a railway can easily

Tabriz.

be laid on it, and carried on beyond Tabriz, to Teheran or wherever conditions may render desirable. Another extension might be made from the Trans-Caspian railway from Astrabad to Meshed, between which

places a good waggon road now exists. But enough has been said to show that the question involves so many political and strategical matters as to place it outside the scope of this lecture. Under present conditions, railways being seemingly impossible, the next best thing would be to construct roads, not carriage roads, which have not proved much of a success in Persia, but good mule tracks fit for the caravans, which cost a great deal less to construct, and are more acceptable to the natives. These tracks should be well patrolled and made secure from robber gangs. In accordance with this, a route for

Robat.

trade has been opened up from Nushki to Robat and Seistan, and another from Ahwaz on the Karun river through the Bakhtiari country to Isfahan, but many more would be necessary to foster commerce by opening up the country, and lowering the excessive transport charges which at present handicap and strangle it.

The Persian Gulf possesses particular interest for Britain. Her supremacy here was gained after successive struggles with the Portuguese, Dutch and French. For the last century, at great expense of men and treasure, she has engaged herself in reducing it to order, suppressing piracy, and opening it up to commerce, and, in proof of her *bonâ fide* intentions, it must be noted that she has not here the smallest naval base for her warships. The British warships are welcome guests at the various places about here, which exist under their protection; but a port that would act as a distributing centre for commerce would be of great value. It would have to be completely under British control and would cost money, because, as has been explained above, ports here suffer from great disadvantages of climate, water, and natural qualifications for harbours. The benefits to commerce resulting from the opening up and keeping of order of the Persian Gulf by Britain are open to the whole world.

Railway enterprise in Asia Minor will, in the future, affect the Persian Gulf, if the line projected reaches a terminus on it.

It is necessary to go back as far as 1880 to trace this matter to its source. In that year a Gladstonian ministry succeeded a Beaconsfield ministry, and the policy of the latter with regard to Turkey was reversed, and Britain no longer stood forward prominently as the champion and adviser of that country. Germany then stepped into the vacant place, gradually built up her influence, and, in 1903, a German company obtained a concession for a railway across Asia Minor to Baghdad with an extension to the Persian Gulf. It is this last extension which chiefly interests Britain. Germany began by asking the co-operation of Britain and France in this undertaking, though why she should share her good fortune with other powers is a matter for conjecture. Probably sufficient money was not forthcoming to carry out so great an enterprise, her position and influence at Constantinople wanted sounder foundations, and the jealousy and disfavour with which rival powers might view her being in sole possession of Asia Minor would be thus allayed. It is also suggested that she desired Britain's help in obtaining a port on the

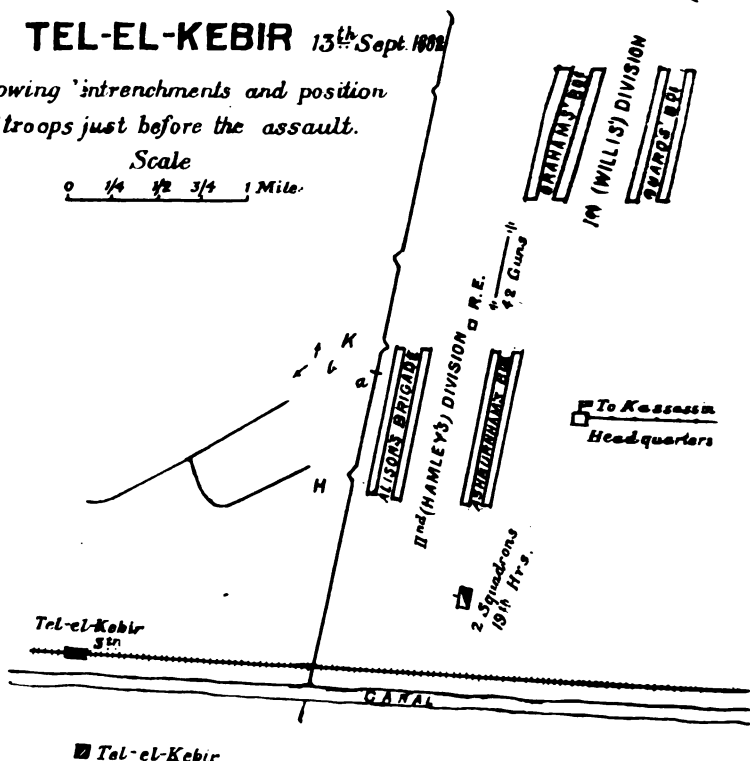
Persian Gulf as terminus of the railway, and a contract for the carriage of the Indian mail. With regard to the mails, it is calculated that by this route, they would be landed about four days earlier at Karachi than they are now, under existing arrangements, at Bombay. Obviously the greater part of India would lose by this. As regards passengers from India, few would care to exchange the comfort of a first class mail steamer for the changes and other discomforts of a railway. In any case negotiations did not progress, as equal powers of control, construction, and management were not sufficiently guaranteed, and there the matter rests for the present. The line has been pushed forward to the Taurus range, but has not yet passed through it, though this will not be a specially difficult feat of engineering, as a rift in the mountains exists, a historical pass through which many invading armies have passed in olden days. For the railway to pass here, money is necessary, for this will be a most expensive section of the line. In the meantime the company have bought up the small existing line on the southern side of the Taurus from Mersina to Adana which will enable them to postpone the negotiation of this obstacle for the time being. Obviously the section in which Britain is most interested is the Baghdad Gulf section, for she has more trade interests here than any other nation, and it affects the Persian Gulf. It is estimated that this section would be a most valuable one, though there is a possibility that, should the navigation of the rivers be improved, it would have water carriage to compete against, though as no trouble has been taken to make these rivers really navigable, when they have no railway, why should it be done, when they have the convenience of a railway? There is no doubt a railway would stimulate commerce, be a great incentive to the development of Mesopotamia, where now the difficulties of transportation are enormous, and be popular with the inhabitants, who are asking for it. Lastly, there are sacred Mohammedan shrines in this district, which would ensure a large passenger traffic. There should be an immense grain traffic, and, if indications are correct, large quantities of petroleum also. One clause in the concession provides against the section from Baghdad to the Gulf being opened till every other section of the railway is completed. It is the sections in Asia Minor that are within the German sphere of influence and profit, while the Baghdad Gulf section most concerns Britain, so this may prove a stumbling block for a settlement in the future. The fairest solution that has been suggested is that each country should construct the section in which their interests lie; each working from their own base, Germany from the Mediterranean, Britain from the Gulf, and, when they meet at Baghdad, run the whole on joint traffic arrangements for mutual benefit. There is a proposed branch line from Baghdad to Khanakin near the Persian frontier, which would affect British interests, for this is the easiest way for trade to penetrate into Northern Persia from the Gulf, although longest in mileage. By this route all heavy merchandise is imported, which would be difficult to get over the bad passes on other routes.

TEL-EL-KEBIR 13th Sept 1902

Showing 'intrenchments and position of troops just before the assault.

Scale

0 1/4 1/2 3/4 1 Mile.



■ Tel-el-Kebir



LOWER EGYPT

Scale 0 25 50 Miles

AN EPITOME OF THE 1882 CAMPAIGN.

Causes of the War.

BY CAPTAIN H. ROWAN-ROBINSON, R.G.A.

In the Egyptian army under Ismail were two classes of officers—Turkish or Circassian and Egyptian or Fellaheen. The former, though in the minority, were in high favour and held all the more important posts. The Egyptians naturally resented this and as a remedy formed the “National Party” at the head of which were Ahmed Arabi (afterwards Arabi Pasha) and a politician Mahmud Sami Pasha.

After the deposition of Ismail in 1879, this party with the help of the army, became all powerful and treated Tewfik—the new Khedive—with scant respect: apart from the military movement, discontent was abroad in the land. Severe taxation, caused by the pressure of foreign money-lenders, had given rise to a wish to limit the power of the Khedive and to abolish the Anglo-French control which, it was believed, was ruling the country for the benefit of foreign bond-holders.

Discontent was breeding anarchy; so at Gambetta's suggestion a joint note was despatched by England and France demanding the maintenance in power of the Khedive, as a guarantee of good order. Shortly afterwards the Gambetta Ministry fell, the attitude of France changed, and the note not being backed up by any show of force merely offended the Porte and disappointed the Khedive.

On the 20th May 1882 a small Anglo-French fleet appeared at Alexandria, and on the 25th May a dual note was presented demanding the retirement of Arabi from Egypt and the resignation of the Mahmud Sami Ministry. The latter resigned but Arabi was shortly afterwards re-appointed Minister of War.

On the 11th June serious riots broke out in Alexandria in which many Europeans were massacred. Public feeling in England was aroused. On the 24th June the English and French Controllers received notice to quit, and Arabi, having announced his intention of resisting any landing, pushed on vigorously with the earthworks at Aboukir and Alexandria. It was at this time that the Sultan conferred on him the Grand Cross of the Medjidie.

Admiral Sir Beauchamp Seymour reported that the continued fortification of Alexandria constituted a danger to the British fleet in the harbour. He was accordingly instructed to take the necessary action. On the 10th July he presented an ultimatum; on the 11th he began the bombardment.

Military Plans and Preparations.

As it was far from probable that naval action would decide the conflict, it was decided to organise a large expeditionary force. Sir Garnet Wolseley was appointed to the command. He recognised that a prolonged occupation of the Suez Canal was impossible, for the enemy, holding the delta, his movements and supply facilitated by the railways from Zagazig to Salahieh and Ismalia, could strike when and where he pleased against the force in occupation, necessarily dispersed for the fulfilment of their duties. Such police work is wearisome to troops and fatal to efficiency. Moreover, so inactive a policy would encourage the Bedouin tribes on the east to acts of hostility. A single successful attack upon any point would enable the enemy to block the whole canal. Cairo was obviously the true objective. The seat of disorder was there, as also were the keys of the water-supply for Alexandria and the stations on the Suez Canal. Sir Garnet Wolseley's force consisted of two Divisions of Infantry, one Brigade of Cavalry and an Indian Contingent. He recognised from the first that the correct line of advance was from Ismalia, and not from Alexandria to Cairo. Such a movement was unexpected by the enemy and would turn his main position at Damanhour and Kafr-ed-Dowar; the troops would have a shorter distance to traverse and would meet with fewer physical obstacles.

The Operations.

The bombardment had been successful and Alexandria occupied. Troops from Gibraltar and Malta were collected at Cyprus and formed into a Brigade under Sir A. Alison. On the 17th July they were moved to Alexandria owing to the need for police work and in order to hold Arabi's main forces as long as possible between that place and Cairo. The enemy had taken up a strong position at Kafr-ed-Dowar where, by making cuttings in the Mahamu-dieh canal, he had covered his front with an inundation and at the same time deprived Alexandria of fresh water.

When the beds of Lakes Aboukir and Mareotis are covered with water only three approaches are possible, between the lakes and the sea from east or west or along the railway and canal from the south-east. The last and most important was commanded by the ridge at Ramleh which was therefore occupied and entrenched.

Reconnaissances were carried out by mounted infantry and an armoured train and several feint attacks were made on Arabi's troops with the object of retaining them in their position.

The British force was now being rapidly augmented. On the 15th August Wolseley arrived. On the 19th, 20th and 21st Port Said, Elkantara, Ismalia, Scrapeum and Shaluf were seized by the Navy and by part of the Indian Contingent which had arrived at Suez. The canal was thus secured and no ships allowed to enter. On the 19th the 2nd Division arrived and the guards re-embarked,

Every effort was made to deceive the enemy as to the line of operation. It was publicly announced that a combined land and sea attack was to be made on Aboukir and, to strengthen the deception, a movement was to be made against Arabi's position. Further it was stated that a number of locomotives which were embarked at this time for Ismalia were destined for use in Cyprus.

On the 19th a fleet of ironclads and transports anchored off Aboukir, the former clearing for action. At night however they steamed off towards Port Said. On the 21st Wolseley arrived at Ismalia and immediately sent forward a detachment to occupy Nefisha. By the 22nd the whole of the railway and sweet-water canal between Suez and Ismalia was in our hands, and, by the 23rd, 9,000 men had landed and were at work on a train line which was to connect the landing stage with the railway.

Ismalia proved to be an excellent base. It was a regular oasis in the desert; it possessed good buildings, suitable for hospitals, stores and offices and well laid out shady streets. The sweet-water canal runs from El Abasa at the edge of the delta *via* Kassassin to Ismalia. The immediate banks are bordered with desert. Here and there scant patches of cultivation are to be seen which increase in size 15 miles from Ismalia, where the ancient Wadi becomes well defined and gradually broadens till it reaches the delta. Deep drifts of blown sand along the route make wheeled transport almost impossible.

As water was a most important factor it was essential to success that the enemy should be prevented as far as possible from damaging the canal. On the 24th therefore a small force was pushed on to Magfar, at which point the canal was particularly vulnerable. On that and on the two following days the enemy was driven from Magfar, Tel-el-Mashkuta, Mahsama and Kassassin and the latter place occupied. The advance had been carried out under considerable difficulties. The heat was intense, the sand very heavy and the regimental wheeled transport quite unsuited to the country. Supplies were forwarded chiefly by boat. With the capture of Kassassin the way had been made clear for the collection of such rolling-stock on the railway and transport on the canal as would, in a given time, suffice for the accumulation of the vast supplies required for the advance of the whole army. Most of the Indian Contingent was at Suez and Hamley's Division was still at Alexandria making demonstrations against Kafr-ed-Dowar. It was decided to hold back the mass of the force from Kassassin so that supplies should not be eaten up as they arrived.

Steam launches were put on the canal for the purpose of towing barges, and large working parties removed the dams and embankments which had been built across the railway and canal. The best obstacle to our progress put in our path by the Egyptians was the filling up with sand of a length of 25 yards of a deep railway cutting. This took four days to remove.

About the 20th August the enemy's troops were thus distributed :—

Kafr-ed-Dowar	...	...	...	18,000
Aboukir and Rosetta	...	...	...	15,000
Damietta	...	...	...	7,000
Tel-el-Kebir and eastern delta	...	...	...	15,000
Cairo	...	...	...	11,000
Total				66,000

After the capture of Ismalia 40,000 recruits were enlisted. The effect of the feint on Aboukir was that 3,000 troops were sent there from Cairo as a reinforcement. The Egyptians are skilled in the art of making embankments. To meet the British movement from the east they proposed to utilise this skill by constructing an enormous entrenchment from Salahieh to Tel-el-Kebir (20 miles) and thence on the Dar-el-Beida (30 miles) a point on the old Cairo-Suez road. It was the same old Wall of China scheme—so dear to semi-savage races. Events however marched too rapidly ; the monster entrenchment was never completed.

On the 28th August the enemy made a feeble attack on our advanced position at Kassassin and was repulsed with loss. The main interest in the day's fighting centres in a cavalry action some two miles to the north of Kassassin. It furnishes a rare instance of the skilful handling of horse artillery and cavalry in combination. General Lowe advanced against the Egyptian position with the 7th D. G.'s in front and the Household Cavalry, right refused, in second line. Finding himself exposed to the full fire of the enemy's artillery and infantry, he uncovered the front of the guns, ordered the latter into action and wheeled the 7th D. G.'s to the rear of the Household Cavalry. The cavalry, supported by the fire of the guns, then charged home and completely routed the enemy.

The next 12 days were full of hard disembarkation and supply work and other preparations. On the 1st September Sir E. Hamley, having left a small force, under Sir Evelyn Wood, at Alexandria, arrived with Sir A. Alison's Brigade at Ismalia. A regular train service was now established to Kassassin. The date fixed for the concentration of the whole force at that point was the 12th September.

On the 9th however the Egyptians made a combined attack from the directions of Tel-el-Kebir and Salahieh. They were again driven off with loss and the pursuit was continued to within three miles of Tel-el-Kebir. Had it been further pushed, it is possible that the lines there might have been captured. The plans of the Commander included however an immediate advance of the Cavalry Division on Cairo after a decisive defeat of the enemy. Such an advance could not then have been organised and Arubi would have had time to carry out his threat of burning Cairo.

By the 12th the concentration at Kassassin was completed. After a thorough personal reconnaissance of the Egyptian lines at

Tel-el-Kebir Wolseley decided to try and carry them by an attack at dawn after a night march. His reasons were as follows:—

He wished to save the troops from the losses they would incur in an advance across the open in daylight and from an exhausting march and battle during the heat of the day, when water-supply would be difficult owing to the necessity of moving away from the canal.

He had observed that the enemy only pushed his outposts beyond the entrenchments at daybreak. Throughout the campaign Tel-el-Kebir had been looked upon as the gateway to Cairo and Zagazig. For final success it was necessary that the enemy should be, not only manœuvred out of his position, but thoroughly crushed. The attack at dawn would give the maximum of daylight for the advance of the cavalry on Cairo and of the infantry on Zagazig. Any attempt to turn the position would have merely resulted in a prolongation of the war, for Arabi could have fallen back on Zagazig or Cairo and in the cultivated country could have avoided decisive engagements.

The following precautions were adopted to secure the success of the operation:—

The position of enemy's lines and the points on which his flanks rested were accurately fixed by measurements and cross-bearings.

The utmost secrecy was maintained till the morning of the 12th when Wolseley rode out with his Divisional and Brigade Commanders and personally explained the nature of the intended movement.

A separate sphere of operations was assigned to each Division so that if one should meet with unexpected obstacles or serious resistance the other would strike its blow independently.

The Indian Contingent and the Naval Brigade which were to move respectively south of and along the railway were to start an hour later than the remainder as their march was certain to be discovered by dogs, etc., in the villages. Seven batteries were to be moved massed between the two Divisions to break down the resistance at any point or to cover the rally of either Division as required.

Lines of direction which by a due west march, would bring the two Divisions to their assigned portions of the enemy's lines, were marked by posts placed by the R. E. after sunset.

The cavalry and R. H. A. on the extreme right were to sweep round the rear of the enemy as soon as he was engaged in front to threaten his line of retreat and to be ready to take up the pursuit.

In the rough plan of attack issued, 1,000 yards of frontage was allotted to each Division and 1,200 yards to the 42 guns.

The following are some extracts from the attack orders:—

The infantry will carry 100 rounds per man.

The transport will be brigaded at daylight north of the canal and will then follow the army.

Baggage animals carrying 30 rounds per man will press forward at daylight.

The force employed consisted of 2,800 cavalry, 12,000 infantry, 61 guns and 6 gatlings.

The troops moved off at 1-30 A.M. The night was dark and somewhat cloudy so the guides had to keep direction by picking up various stars in succession. Notwithstanding the precautions taken when the leading troops struck the entrenchments, the line had resolved itself into an echelon as below:—

Highland Bde. (2nd Divn.)

Guns.

2nd Bde. (1st Divn.)

Thus when the attack began the leading Brigade of the 1st Division was about half a mile from the parapet. At 5 A.M. the signal was given for the assault and after a short but severe struggle the Highlanders carried the part of the parapet between H and K. The flanks of the Brigade, meeting with a sterner resistance were at first repulsed. The centre pushing on against the 2nd line of entrenchments was brought to a standstill.

On the right the 2nd Brigade attacking some 15 minutes later carried that portion of the line in its front.

In the centre the guns opened fire and Brancker's battery, passing through a gap in the parapet (at point 'a' in sketch) came into action (at point 'b') against the enemy's rear enfilading the lines both to north and south-west. This decided the action: the enemy fled in disorder, hotly pursued by the cavalry.

The Naval Brigade and Indian Contingent moving along and south of the railway overcame all resistance in that direction and captured 12 guns.

The enemy's strength was 20,000 with 75 guns, of whom 10 battalions and 54 guns manned the main parapet.

Wolseley issued immediate orders for the pursuit.

The cavalry was directed to move rapidly on Cairo and save it from the threatened destruction.

The Indian Contingent was to march on Zagazig and so break the connection between the various portions of the Egyptian army dispersed throughout the delta.

On the 14th September the cavalry arrived at Cairo.

Arabi Pasha surrendered and his remaining troops laid down their arms.

The Indian Contingent reached Zagazig on the 13th having marched 30 miles and fought an action in 16½ hours. The Highland Brigade pushed on to Tanta and by the 24th September resistance in all parts of the country had ceased. On the 25th the Khedive made a triumphal entry into Cairo.

Summary.

11th July—Bombardment of Alexandria.

27th July—Expedition decided on £2,300,000 voted.

30th July—11th August—Troops left England.

15th August—Wolseley arrived in Alexandria.

20th August—Ismalia and other points in Suez Canal seized,

13th September—The Egyptian army defeated at Tel-el-Kebir.

14th September—Cairo surrenders.

24th September—All resistance ends.

Comments.

The call to arms is the last resource of diplomacy, but the diplomat should arrange so that the arms may be wielded in the most effective manner. An ultimatum should be followed as soon as possible by a crushing blow. To bombard Alexandria was merely to beat in the air. It enraged the people and created rather than overcame resistance. Had a small force been collected at Cyprus in transports by the 11th July the campaign would have been won at a far smaller cost.

The success of the expedition was mainly due to the correct selection of the line of operations, to the wonderful secrecy maintained as to its direction, to able leading and to good staff work.

The British General's plan was never fathomed and the result was that the enemy, who for a savage foe had a curiously bad intelligence department, kept his forces dispersed to meet every possible attack.

Arabi's best plan would have been the concentration of his main forces about Tanta. There at the centre of a network of railways, in a particularly rebellious district and in a fertile country, he could have threatened the flank of any movement on Cairo from Alexandria or Ismalia, and, if attacked, could have maintained a prolonged resistance among the intricacies of the delta. No leader of a semi-civilised army however could have carried out such a plan, for at the first threat against the capital, public opinion would have forced him to directly bar the road towards it.

There is hardly in all history an instance of a pursuit, both tactical and strategical, more brilliant than that which followed Tel-el-Kebir.*

The following works have been consulted :—

The Official History by Colonel E. Maurice.

An Official Report by Lieut.-Col. W. E. Butler.

The Egyptian Campaigns (C. Royle).

Report by the American Attaché.

Callwell's Small Wars.

* NOTE.—This was partly due to the excellent condition of the horses to whom the dry climate was particularly suitable. Up till the 15th September, the cavalry only lost 210 horses, while from India to Cairo the Mountain Battery with the Indian Contingent did not lose a single animal.

NOTES ON LINE OF COMMUNICATION TRANSPORT.

BY MAJOR R. E. VAUGHAN, A.Q.M.G., TRANSPORT.

These notes will only attempt to deal with some of the questions affecting animal transport on the advanced lines of communication. In the present condition of affairs, the earliest movements of any forces beyond the head of the main lines of railways in India must be followed at once by the organisation of a line of animal transport for the purpose of maintaining the troops in the fighting line with a sufficient supply of food, ammunition, clothing, medical stores and miscellaneous equipment. Every endeavour would naturally be made to push forward a line of railway, but, as the pace of movement of troops compared with the rate of railway construction will create a gap between railhead and the army in the field, the interval has to be bridged by means of animal transport.

Practically the whole of this transport has to be obtained from the resources of the country when the occasion arises: and it is distinct from that which is maintained for equipping divisions of the field army with the means of carrying with them their immediate necessities in the shape of baggage, rations and ammunition.

2. The transport on the lines of communication provides for the replenishment of the expenditure of supplies and equipment involved in the maintenance of an army in the field. To ensure success this replenishment must be timely, regular and complete, and to achieve this object must be the constant purpose of the Line of Communication Staff.

The fact that this transport is drawn from the country on the occasion of emergency means that it is collected in haste: that it represents masses of men and animals never before gathered together in formed bodies: and is possessed of no organisation in practice until the day of trial. To make the best use of this crude and heterogeneous mass demands, in those charged with its administration, qualities of patience, resourcefulness and perseverance of no mean order.

3. The animal transport on lines of communication is worked in convoys, and, as explained in "Combined Training, § 29," there are three methods of operation:—

- (a) Direct Convoys.
- (b) Staging Convoys.
- (c) Convoys on the meeting or exchanging system.

In the first case, the whole convoy goes through from starting point to terminus. In the second, the convoy moves from day to day over a given section of the road, going out laden and returning

empty. The last is an arrangement whereby animals and vehicles meet at a point intermediate between two fixed stations on the road, and, after transferring loads, return the same day to their respective starting points.

4. Direct convoys are generally used ahead of the advanced

Direct Convoys.

depôt of supplies: they would also be resorted to if the posts on the line were separated by an interval of several days' march; or for delivery to a given point of special consignments of supplies and equipment, the weight of which is in excess of the carrying power of the ordinary staging transport and which might only be required by the army at the front at varying intervals.

Direct Convoys have certain disadvantages:—

They are harassing to the transport and to the troops engaged in their protection.

They require large escorts.

The daily marches involve risk and delay, and their camps cannot always be sufficiently fortified at night, owing to want of time.

In the working of direct convoys there is a factor of great importance, and that is the duration of its "useful life" as a convoy, or, in other words, the consideration of the time that it will take to eat its own load if, as may often happen beyond the India frontier, it moves through an inhospitable and sparsely populated country which necessitates conveyance of its own rations and grain and possibly a modicum of fodder.

Now it is stated (Frontier Warfare, 1906, para. 88) that to protect fully a convoy of 1,000 camels in difficult country held by an enterprising enemy, when the road cannot be picquetted by Line of Communication Troops, the escort must consist at least of two battalions of infantry. The weight of one day's rations and one day's grain for a battalion of native infantry, with its usual complement of transport is 43 maunds, or 86 maunds for an escort of two battalions. If the convoy consisted of a Camel Corps, with 972 camels and the usual complement of 378 men it would consume in grain and ration 85 maunds a day. To feed the escort in addition, the total consumption would rise to 170 maunds a day, or 3·86 per cent. of the total carrying power of the convoy, which is 4,400 maunds: so that the convoy with its escort would be "eaten out" in 26 days. In other words, after marching five days out and five days back, supporting itself and the escort, a convoy of 972 camels, or 1 corps, would have taken from its load for its own subsistence 1,700 maunds, and would deliver 2,700 maunds only at its destination, which is approximately the weight of rations and grain for a division of all arms for two days; and at least ten days must elapse before the same convoy could repeat the process of delivery for a similar body of troops at the same distance from their base of supply.

When the convoy consists of animals of the lowest carrying power, or 2-maund standard, its effective work in relation to the

supply of troops is seriously diminished. A pack-mule corps, with its 768 mules, 14 ponies and personnel of 363 men, requires 64 maunds of grain and rations daily for its own support. Assuming that in circumstances similar to the case of the camel corps mentioned above, the escort consisted of one battalion of native infantry, the total consumption of supplies daily would be 107 maunds out of a total carrying power of 1,281 maunds. The convoy and escort thus use 8.35 per cent. daily out of the total load carried, so that the convoy is "eaten out" in 12 days. In other words, the convoy and escort moving out for a three days' march and back and supporting itself in grain and rations throughout the movement, would use 642 maunds and deliver some 640 maunds at destination, which is barely half a day's rations and grain for a division of all arms.

It is therefore a fair conclusion that the system of supply by direct convoys is only useful for short distances from the base, and that even this value is discounted if strong escorts are required.

5. The staging and exchanging systems are worked when the posts on the line of communication have been established at one day's march apart.

It is also practically essential that the field telegraph should have been established, so that any accident interfering with the movement of stores on any particular day may be made known immediately over the line: otherwise troops and transport would be subject to unnecessary work and confused by the temporary uncertainty as to the time of resumption of the flow of stores.

Both systems provide for a regular transmission of supplies to the front. Each requires practically the same number of animals, but in the staging system the transport would have to carry its own baggage and line gear, and also tents, until huts had been erected at the posts: whereas in the meeting system this would be unnecessary, because men and animals return daily to their own standing camps.

6. Tables of requirements in transport for the exchanging system are given in the Field Service Code Comst.-Transport, which is, however, an obsolete publication. They exhibit the numbers of animals which must be placed at each post on the line of communication, from one up to twenty stages, calculated for the daily transmission of a unit of weight of 1,000 maunds for consumption at the terminus of the line: this may be referred to as the "useful load." In addition provision is made for passing forward grain and rations for the daily use of the animals and men forming the exchanging transport.

In the accompanying diagram the tables for a line of 3 marches, with two intermediate stages are analysed, the tractive power being carts with 2 bullocks, each bullock hauling 5 maunds. By substituting camels for bullocks, and omitting all references to carts, the figures are practically applicable to camel transport. The data assumed are that fuel and fodder are obtained locally, and that 5 per cent. spare animals also are placed at each stage to replace casualties, and 5 per cent. for the whole line are held in reserve at the base.

The diagram shows the number of men, animals and carts at each permanent camp, and the numbers which meet every day at a half-way point where loads are exchanged.

7. There are six principal factors which affect the work of convoys on the exchanging system:—

- (a) Road space.
- (b) Pace of convoys.
- (c) The season of the year, or the number of hours of daylight.
- (d) Fodder supply.
- (e) Water supply.
- (f) Space at permanent camp and at points of transit of loads, and these will be considered in turn.

8. The available road space in the first march out from the base largely determines the amount of transport which it is possible to employ, and therefore

Road space. will effect the maximum output from the base.

Taking the data given in Field Service Regulations, India 1906, Chapter III, para. 46, it is seen that 25 carts, each with 2 bullocks, occupy 175 yards of road, equivalent to 250 carts to the mile. On a ten-mile stage, with an exchanging station half-way, each half-section between the base and the first post on the line of communication will carry 5×250 or 1,250 carts, the road being packed at its fullest capacity. By applying the figures in the diagram in Fig. 2 of a movement of three marches, it will be seen that there can be obtained a permanent factor to determine the useful load which a number of carts placed on the road

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Therefore in the case referred to the load available for communication at a terminus 3 marches from the base is $\frac{1}{11} \times 1,000$ maximum = 11,360 maunds.

It is possible that if the first stage out from the base were unusually long and were succeeded by a very short march to the second post, the carrying power of this second section of the line might have an appreciable effect on the maximum output to the base, but when the first two stages are of nearly equal length the road capacity of the first is the important factor.

When the road is so wide as to carry a double stream of convoys in single file, or several avenues of approach to the advanced base exist, the output is of course increased in proportion without consideration of the space required for the passage of troops.

9. The next point is the pace of convoys, and this comes with the number of hours of daylight remaining, and the length of the stage.

Pace of convey determines the carrying capacity. The ordinary pace of troops according to its class is given in Chapter III of the Field Service Regulations 1906, the brack cart being shown as capable of 10 miles per hour. Using the circumstances applied to in this case, road space it is seen that on the exchanging system it will take 20 hours 20 minutes before the first cart that leaves the base will have

traversed the 5 miles to the meeting point, and it will be 6 hours 40 minutes before the last cart reaches the same point. If the road only carries a single stream of transport it would not be free to take the empty transport on the return journey until the last cart arrives at the exchanging intermediate station; therefore the return journey of the first cart cannot begin until 6 hours 40 minutes after departure from the morning's starting point. If it be assumed that the pace of empty carts can be quickened slightly, so as to occupy 3 hours, then each transport cart is actually absent from its permanent camp 9 hours 40 minutes; but the movement which the troops have to protect extends over more than 13 hours.

In the other half of the stage the loads are moved upwards in the latter half of the day, when the pace will be slowest: consequently it is important that empty transport coming down should be placed in position at the exchanging point as early as possible, so as to let carts get away on the upward journey as soon as ever loads can be exchanged.

The following time-table will explain the movements:—

First loaded cart leaves starting point	...	5 A.M.
Last " " "	...	8-20 A.M.
First loaded cart reaches exchanging station...	8-20 A.M.	
Last " " "	..	11-40 A.M.
First empty cart leaves exchanging station ..	11-40 A.M.	
Last " " "	...	2-40 P.M.
First empty cart arrives starting point	...	2-40 P.M.
Last " " "	...	5-40 P.M.

The staging system requires that, in comparison with the exchanging system, twice as many loaded carts should leave the base every alternate day in order to transmit the same weight of stores: they will return empty every second day. At 250 carts to the mile, a ten-mile stage will hold 2,500 carts at the fullest capacity of the road. At a pace of $1\frac{1}{2}$ miles per hour, laden carts will take 6 hours 40 minutes to travel ten miles, and on a single track the last cart cannot leave the starting point until the first arrives at the terminus. The time-table would be as follows:—

First cart leaves starting point laden	...	5 A.M.
" arrives at terminus, 10 miles	...	11-40 A.M.
Last cart leaves starting point, laden	..	11-40 A.M.
" arrives at terminus	...	6-20 P.M.

So that the whole movement would be somewhat slower than it is in the exchanging system on the day laden carts are in motion, but could be slightly quickened the succeeding day when they are travelling empty. There is probably heavier wear and tear on animals in a system which entails a continuous pull of 10 miles in laden vehicles than in the exchanging system. It is exceedingly doubtful whether in practice bullock transport would keep closed up to a formation of 250 vehicles to the mile, especially in the case of newly-raised trains, with undisciplined drivers taken straight from their villages: it seems not unlikely that, with checks and

straggling and uneven movements caused by heavy gradients and less powerful animals would have a tendency to lower the above numbers it would be possible to put on the road a single camel reduced to 125 carts per mile, or 8 miles per 1000 carts, which is practically the figure given in the tables on page 55 of the *Notes of Frontier Warfare*.

10. An examination of the figures given in the stages mentioned in para. 6 gives an idea of what may be called the "load value" of each convoy animal on lines of communication. In the following columns the figures are given in relation to a useful load of 1000 maunds carried on 5-mound animals or bullocks and are found by calculating the amount of work which every employed animal assists to deliver.

No. of marches	No. of intermediate stages	No. of animals employed	Load value of each animal
1	2	1000	1000
2	3	1667	600
3	4	2500	400
4	5	3333	300
5	6	4167	240
6	7	5000	200
7	8	5833	171
8	9	6667	150

and so on until over a line of 10 marches with 15 intermediate stages there are 9589 camels required to accomplish delivery of 1000 maunds or 834 lbs. useful load per head.

11. Now these figures can be applied to the investigation of the approximate size of the force which can be supported by any one series of roads having a given capacity for carrying supplies. A calculation of the weight of nations and ground forces existing in Infantry divisions according to the statistics in Appendix XX, *Field Service Regulations India 1896* shows that one division (with motor cycle 114 British troops and 10000 ground force) weighs a total 165,000 lbs. or 165 tons. This weight is supported by a single bridge for a march of 720 lbs. per foot, or 120 tons per foot, or 1600 tons per mile. The weight of the force is supported by the road at the rate of 1000 tons per mile.

So over a line of 10 marches with 15 intermediate stages a force of 165,000 lbs. or 165 tons can be supported by a single road at 1000 tons per mile, or 834 lbs. useful load per head.

fighting men; and for $\frac{57.14}{7.25}$, or 7.88 men of a division of all arms, inclusive of the needs of their horses, followers, etc. In other words, over a line of this length,

1 000 cavalry men require 290 camels

1,000 infantry men require 127 camels

for the feeding of themselves and their necessary entourage. If the supply of half a ration of fodder to the front be imposed on the line of communication transport, the amount needed for the mounted soldier rises to 31 lbs. per diem, and for the other man 12½ lbs. daily. In this case the 1,000 cavalrymen will want 543 camels, and the 1,000 infantrymen 215 camels for their maintenance. Speaking roughly, therefore, the transmission of half a ration of fodder to the front every day either doubles the amount of the line of communication transport, or halves the size of the force that any given number of animals can support

12. When the line of communication is short and the operations of a minor character, so that the roads are not filled by staging transport, both the staging transport and the post garrisons may be conveniently fed by direct convoys from the base: and in the same way the posts nearest to the base might be stocked in the case of a large concentration of troops, if the circumstances permitted.

The point is best illustrated by examples.

The line consists of the base and four posts.

The weight of 15 days' stock of supplies for the post garrison and staging transport to be located there is taken to be:—

At No. 4 post	...	...	1,000 Maunds.
At „ 3 „	...	...	900 „
At „ 2 „	...	...	900 „
At „ 1 „	...	...	900 „

Base

The round journey from base to 4th post and back can be done in 7 days. The transport for stocking these posts carries its own rations and grain, but spare animals are not included, on account both of the shortness of the journey and the fact that unloaded animals become available. The transport required will be—

To stock No. 1 post	...	...	180 camels.
Do. „ 2 „	...	...	180 camels plus 13 to carry 4 days' supplies*
Do. „ 3 „	...	...	180 camels plus 21 to carry 6 days' supplies*
Do. „ 4 „	...	...	200 camels plus 28 to carry 7 days' supplies.*
Total			... 802 camels.

* At 7½ lbs. per camel per diem, including grain for the animal and share of rations for the driver

The diagram following shows the daily movements of the 82 camels, the numbers moving out and returning over each march, and the date of return of the convoy used for each post.

No. of Post	Days of movement						
	1st	2nd	3rd	4th	5th	6th	7th
No. 4							
No. 3							
No. 2							
No. 1							
Base							

The use of this form of diagram is convenient alike to the transport and the supply officer. From it the former can watch the movement of transport and date of its return to the base, the latter can see at a glance the date when each post was last filled up and what interval replenishments are approximately due. It is presumed that the stock is to be kept up to the level of 15 days supply; there will be small convoys for each post, in relays, corresponding in number to the number of days occupied in going to and returning from each point.

Therefore 2 relays are required for the 1st post, 4 relays for the 2nd, 6 relays for the 3rd, and 7 relays for the 4th.

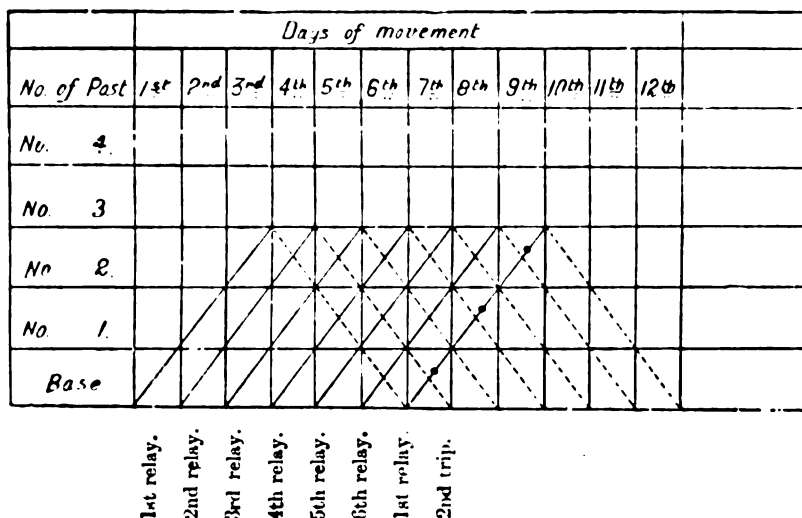
If at Nos. 1, 2, and 3 posts, the daily consumption is 60 mounds, and at No. 4 post 67 mounds, the number of camels required will be—

For No. 1 ...	12×2	or 24 camels
No. 2 ...	13×4	52
No. 3 ...	14×6	84
No. 4 ...	16×7	112

Total ... 272 camels

and 55 mounds should be sent out daily or $12 + 13 + 14 + 16$

The attached diagram illustrates the system of working the relays for stocking the 3rd post, as an example of the general method.



It has been explained how the conveyance over the line of communication of a supply of fodder to the troops and transport at the front impairs the power of the transport on lines of communication to maintain forces operating in the theatre of war.

The figures in diagram No. 2 exhibit the effect on the staging transport of the need for providing fodder for consumption at the post on the lines of communication.

14. The provision of a proper water-supply for animals in hard work is of the greatest importance, if they are to maintain condition. In hot weather

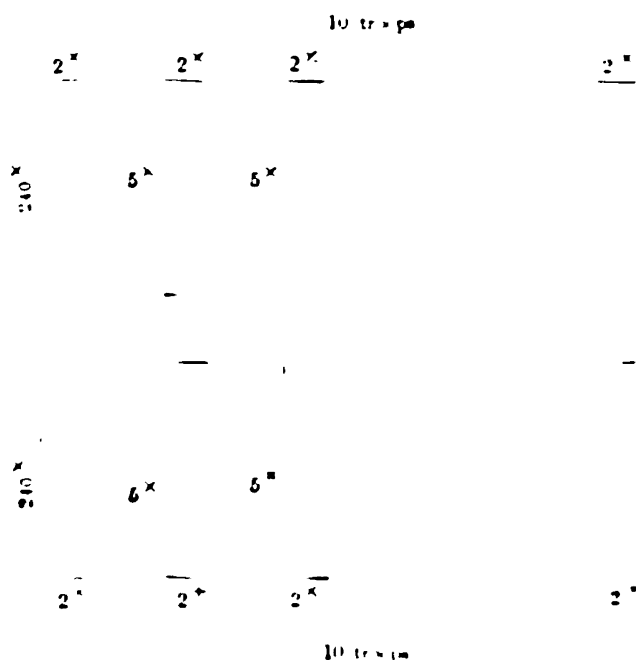
it is essential to supply the transport with water at the exchanging stations. The ordinary requirements may be taken as 10 gallons for each animal and two gallons for each man daily: and it will usually suffice to provide at the meeting point $\frac{1}{4}$ gallon per man to enable them to fill up water bottles and 3 gallons per animal as a refresher. The balance must be provided at the permanent camps.

15. It is important to have sufficient space at exchanging stations to allow carts to be parked in a

Space at exchanging Stations. regular manner, so as to hasten the process of exchange, prevent confusion and facilitate check of loads by officers when handing over charge to one another. The following would be a convenient method:

Park the carts in mass of columns of troops, each troop in a bullock train having 40 carts, with a depth of 6 yards per cart and intervals of 5 yards between each troop in column in the mass,

twenty yards should be allowed between the two bodies of men, when drawn up. Hence the space required for a two body pack train is 1000 yards, which means the transmission of 40000 manpds. of stores, the carrying power of each train would be as follows:—



$240 \times 2 + 20 = 500$, or the depth of the two bodies of men, each other.

$(2 \times 10) + (5 \times 9) = 65$, or the frontage of each body.

Or if the two bodies were drawn up alongside each other, the space would be 240 by $[2 \times 65 + 20]$ or 240 by 150.

16. The space of permanent camps must be greater, otherwise the conditions become intolerably cramped. Provision must be made for tents of the personnel, workshops and sick lines.

Permanent Camps

If more than one unit of transport is stationed at a given place, it should have its separate site.

It would be preferable to have one unit of transport, with its stores, at a central point, getting them in and out of position, and then have the other units at long distances, and to put the stores at a range of not more than a couple of long miles from the central point, in the case of a long train, the camp will have to be a considerable distance from the central point. It would be better to have the stores in the middle of the train.

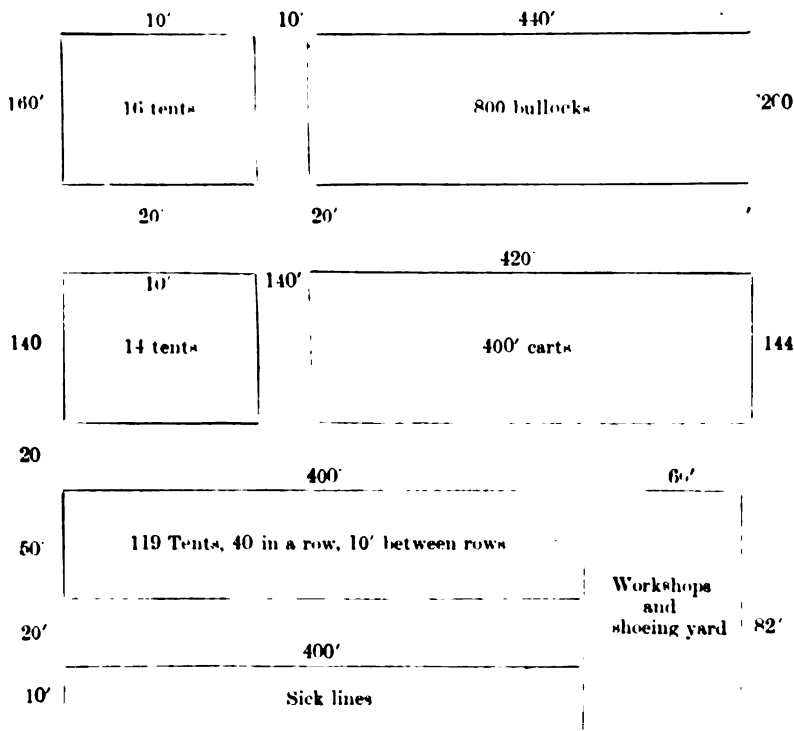
A baggage train is formed in 1000 yds space, has 40000 lbs. of stores, 5000 men and 1400 tents.

A convenient method of arrangement would be the following:—

Picket the bullocks in troops of 88 animals in line, allowing each animal 12' depth and 5' frontage—form double lines of troops, 6' way between troops and 10' way between double troops for movement of attendants.

Park the carts in double lines in blocks of 40 back to back, tipped, poles upwards and outwards; allow for each cart 12' x 7' and 20' space between double rows to allow room for yoking cattle. Space for each tent may be taken as 10' by 10'.

The plan of the camp would then be somewhat as follows:—



Total area 460' by 401', or in round figures 150 yards by 130 yards. The arrangement provides for a proportion of drivers living near the bullock lines and puts the sick lines as far as possible from the working animals.

17. It is convenient, more particularly in working out schemes and making rough calculations for feeding troops, to be able to consider only the number of fighting men, and to be relieved of the necessity for making in each case minute calculations of the number of followers and animals, and the weight of the rations.

A tabular statement is appended, as an example of calculations that any officer can work out for himself from the data given in the Field Service Regulations, India, 1906.

empty. The last is an arrangement whereby animals and vehicles meet at a point intermediate between two fixed stations on the route and, after transferring loads, return the same day to their respective starting points.

4. Direct convoys are generally used ahead of the advance depot of supplies; they would also be resorted to if the posts on the line were separated

by an interval of several days' march; or for delivery to a given point of special consignments of supplies and equipment, the weight of which is in excess of the carrying power of the ordinary stage of transport and which might only be required by the army at the front at varying intervals.

Direct Convoys have certain disadvantages:—

They are harassing to the transport and to the troops engaged in their protection.

They require large escorts.

The daily marches involve risk and delay, and their camps cannot always be sufficiently fortified at night owing to want of time.

In the working of direct convoys there is a factor of great importance, and that is the duration of its "useful life," as a rule, or, in other words, the consideration of the time that it will take to eat its own load if, as may often happen beyond the Indus frontier, it moves through an inhospitable and sparsely populated country, which necessitates conveyance of its own rations and grain and possibly a medium of exchange.

Now it is stated (Frontier Warfare, 1906) para 88 that to protect fully a convoy of 1000 camels in difficult country before an enterprising enemy when the road cannot be protected by Line of Communication Troops the escort must consist at least of two battalions of infantry. The weight of one day's rations and day's grain for a battalion of native infantry with its usual complement of transport is 43 mounds, or 86 mounds for an escort of two battalions. If the convoy consisted of a Camel Corps with 972 camels and the usual complement of 378 men it would consume grain and ration 85 mounds a day. To feed the escort in addition the total consumption would rise to 170 mounds a day or a 50 per cent. of the total carrying power of the convoy, which is 400 mounds; so that the convoy with its escort would be eaten out in 26 days. In other words, after marching five days out and five days back supporting itself and the escort a convoy of 972 camels and corps would have taken from its load for its own subsistence 170 mounds and would deliver 2700 mounds only at its destination, which is approximately the weight of rations and grain for a division of all arms for two days, and at least ten days' march before the same convoy could repeat the process of delivery for a similar body of troops at the same distance from their base of supply.

When the convoy consists of animals of the lowest carrying power, or 2 mound standard, its effective work in relation to the

supply of troops is seriously diminished. A pack-mule corps, with its 768 mules, 14 ponies and personnel of 363 men, requires 64 maunds of grain and rations daily for its own support. Assuming that in circumstances similar to the case of the camel corps mentioned above, the escort consisted of one battalion of native infantry, the total consumption of supplies daily would be 107 maunds out of a total carrying power of 1,281 maunds. The convoy and escort thus use 8.35 per cent. daily out of the total load carried, so that the convoy is "eaten out" in 12 days. In other words, the convoy and escort moving out for a three days' march and back and supporting itself in grain and rations throughout the movement, would use 642 maunds and deliver some 640 maunds at destination, which is barely half a day's rations and grain for a division of all arms.

It is therefore a fair conclusion that the system of supply by direct convoys is only useful for short distances from the base, and that even this value is discounted if strong escorts are required.

5. The staging and exchanging systems are worked when the posts on the line of communication have been established at one day's march apart.

It is also practically essential that the field telegraph should have been established, so that any accident interfering with the movement of stores on any particular day may be made known immediately over the line: otherwise troops and transport would be subject to unnecessary work and confused by the temporary uncertainty as to the time of resumption of the flow of stores.

Both systems provide for a regular transmission of supplies to the front. Each requires practically the same number of animals, but in the staging system the transport would have to carry its own baggage and line gear, and also tents, until huts had been erected at the posts: whereas in the meeting system this would be unnecessary, because men and animals return daily to their own standing camps.

6. Tables of requirements in transport for the exchanging system are given in the Field Service Code Const.-Transport, which is, however, an obsolete publication. They exhibit the numbers of animals which must be placed at each post on the line of communication, from one up to twenty stages, calculated for the daily transmission of a unit of weight of 1,000 maunds for consumption at the terminus of the line: this may be referred to as the "useful load." In addition provision is made for passing forward grain and rations for the daily use of the animals and men forming the exchanging transport.

In the accompanying diagram the tables for a line of 3 marches, with two intermediate stages are analysed, the tractive power being carts with 2 bullocks, each bullock hauling 5 maunds. By substituting camels for bullocks, and omitting all references to carts, the figures are practically applicable to camel transport. The data assumed are that fuel and fodder are obtained locally, and that 5 per cent. spare animals also are placed at each stage to replace casualties, and 5 per cent. for the whole line are held in reserve at the base.

The diagram shows the number of men, animals and carts at each permanent camp, and the numbers which meet every day at the half-way point where loads are exchanged.

7. There are six principal factors which affect the working of convoys on the exchanging system:—

- (a) Road space.
- (b) Pace of convoys.
- (c) The season of the year, or the number of hours of daylight.
- (d) Fodder supply.
- (e) Water supply.
- (f) Space at permanent camp and at points of transfer of loads, and these will be considered in turn.

8. The available road space in the first march out from the base largely determines the amount of transport which it is possible to employ, and therefore will effect the maximum output from the base.

Taking the data given in Field Service Regulations, India, 1906, Chapter III, para. 46, it is seen that 25 carts, each with 2 bullocks occupy 175 yards of road, equivalent to 250 carts to the mile. On a ten-mile stage, with an exchanging station half-way, each half of the section between the base and the first post on the line of communication will carry 5×250 or 1,250 carts, the road being packed to its fullest capacity. By applying the figures in the diagram, in the case of a movement of three marches, it will be seen that there can be obtained a permanent factor to determine the "useful load," which is

$$\frac{110}{110} \times 1,000 \text{ maunds.}$$

Therefore in the case referred to the load available for consumption at a terminus 3 marches from the base is $\frac{1,250}{110} \times 1,000 \text{ maunds} = 11,360 \text{ maunds.}$

It is possible that if the first stage out from the base were unusually long and were succeeded by a very short march to the second post, the carrying power of this second section of the road might have an appreciable effect on the maximum output from the base; but when the first two stages are of nearly equal length, the road capacity of the first is the important factor.

When the road is so wide as to carry a double stream of carts in single file, or several avenues of approach to the advanced depot exist, the output is of course increased in proportion, subject to consideration of the space required for the passage of troops.

9. The next point is the pace of convoys, and this considered with the number of hours of daylight crossing places, and the length of the road, determines the carrying capacity. The ordinary pace of transport according to its class is given in Chapter III of the Field Service Regulations, 1906, the bullock-cart being shewn as capable of $1\frac{1}{2}$ miles per hour. Using the circumstances alluded to in discussing road space, it is seen that, on the exchanging system, it will be 3 hours 20 minutes before the first cart that leaves the base will have

traversed the 5 miles to the meeting point, and it will be 6 hours 40 minutes before the last cart reaches the same point. If the road only carries a single stream of transport it would not be free to take the empty transport on the return journey until the last cart arrives at the exchanging intermediate station; therefore the return journey of the first cart cannot begin until 6 hours 40 minutes after departure from the morning's starting point. If it be assumed that the pace of empty carts can be quickened slightly, so as to occupy 3 hours, then each transport cart is actually absent from its permanent camp 9 hours 40 minutes; but the movement which the troops have to protect extends over more than 13 hours.

In the other half of the stage the loads are moved upwards in the latter half of the day, when the pace will be slowest: consequently it is important that empty transport coming down should be placed in position at the exchanging point as early as possible, so as to let carts get away on the upward journey as soon as ever loads can be exchanged.

The following time-table will explain the movements:—

First loaded cart leaves starting point	...	5 A.M.
Last " " "	...	8-20 A.M.
First loaded cart reaches exchanging station...	8-20 A.M.	
Last " " "	..	11-40 A.M.
First empty cart leaves exchanging station	..	11-40 A.M.
Last " " "	...	2-40 P.M.
First empty cart arrives starting point	...	2-40 P.M.
Last " " "	...	5-40 P.M.

The staging system requires that, in comparison with the exchanging system, twice as many loaded carts should leave the base every alternate day in order to transmit the same weight of stores: they will return empty every second day. At 250 carts to the mile, a ten-mile stage will hold 2,500 carts at the fullest capacity of the road. At a pace of $1\frac{1}{2}$ miles per hour, laden carts will take 6 hours 40 minutes to travel ten miles, and on a single track the last cart cannot leave the starting point until the first arrives at the terminus. The time-table would be as follows:—

First cart leaves starting point laden	...	5 A.M.
" arrives at terminus, 10 miles	...	11-40 A.M.
Last cart leaves starting point, laden	..	11-40 A.M.
" arrives at terminus	...	6-20 P.M.

So that the whole movement would be somewhat slower than it is in the exchanging system on the day laden carts are in motion, but could be slightly quickened the succeeding day when they are travelling empty. There is probably heavier wear and tear on animals in a system which entails a continuous pull of 10 miles in laden vehicles than in the exchanging system. It is exceedingly doubtful whether in practice bullock transport would keep closed up to a formation of 250 vehicles to the mile, especially in the case of newly-raised trains, with undisciplined drivers taken straight from their villages: it seems not unlikely that, with checks and

straggling, and uneven movements caused by heavy gradients, when less powerful animals would have a tendency to lose ground, the numbers it would be possible to put on the road might easily be reduced to 125 carts per mile, or 8 miles per 1,000 carts, and this is practically the figure given in the tables on page 55 of the Manual of Frontier Warfare.

10. An examination of the figures given in the staging tables mentioned in para. 6, gives an idea of what may be called the "useful load value" of each convoy animal on lines of communication. In the following columns the figures are given in relation to a daily useful load of 1,000 maunds carried on 5-maund animals, camels or bullocks, and are found by calculating the amount of useful load which every employed animal assists to deliver :—

No. of marches.	No. of intermediate stages.	No. of animals employed.	Useful load per head of total No. of animals employed.
3	2	1,400	57·14 lbs.
4	3	1,900	42·10 „
5	4	2,419	33·06 „
6	5	2,958	27·04 „
7	6	3,517	22·74 „
8	7	4,079	19·52 „
9	8	4,698	17·03 „

and so on, until over a line of 16 marches with 15 intermediate stages there are 9,589 camels required to accomplish delivery of 1,000 maunds, or 8·34 lbs. useful load per head.

11. Now these figures can be applied to the investigation of the approximate size of the force which can be supported by any road or series of roads having a given capacity for carrying transport. A calculation of the weight of rations and grain for cavalry brigades and infantry divisions, according to the tables in Appendix XXIV, Field Service Regulations, India, 1906, shews that one day's rations (with meat on hoof for British Troops) and one day's grain, represent a total daily allowance of 16·5 lbs. for each fighting man in a cavalry brigade formation, and 7·25 lbs. for each fighting man in a division of all arms, after taking into account the proportionate requirements for their horses, transport animals, followers and non-combatant services.

Over a line of 3 marches, or 2 intermediate stages, each 5-maund animal employed, conveys grain and rations for $\frac{57·14}{16·5}$, or 3·46 cavalry

fighting men; and for $\frac{57.14}{7.25}$, or 7.88 men of a division of all arms, inclusive of the needs of their horses, followers, etc. In other words, over a line of this length,

1,000 cavalry men require 290 camels

1,000 infantry men require 127 camels

for the feeding of themselves and their necessary entourage. If the supply of half a ration of fodder to the front be imposed on the line of communication transport, the amount needed for the mounted soldier rises to 31 lbs. per diem, and for the other man 12½ lbs. daily. In this case the 1,000 cavalymen will want 543 camels, and the 1,000 infantrymen 215 camels for their maintenance. Speaking roughly, therefore, the transmission of half a ration of fodder to the front every day either doubles the amount of the line of communication transport, or halves the size of the force that any given number of animals can support

12. When the line of communication is short and the operations of a minor character, so that the roads are not filled by staging transport, both the staging transport and the post garrisons may be conveniently fed by direct convoys from the base: and in the same way the posts nearest to the base might be stocked in the case of a large concentration of troops, if the circumstances permitted.

The point is best illustrated by examples.

The line consists of the base and four posts.

The weight of 15 days' stock of supplies for the post garrison and staging transport to be located there is taken to be:—

At No. 4 post	...	...	1,000 Maunds.
At „ 3 „	...	...	900 „
At „ 2 „	...	...	900 „
At „ 1 „	...	...	900 „
Base			

The round journey from base to 4th post and back can be done in 7 days. The transport for stocking these posts carries its own rations and grain, but spare animals are not included, on account both of the shortness of the journey and the fact that unloaded animals become available. The transport required will be—

To stock No. 1 post	...	...	180 camels.
Do. „ 2 „	...	...	180 camels plus 13 to carry 4 days' supplies*
Do. „ 3 „	...	...	180 camels plus 21 to carry 6 days' supplies*
Do. „ 4 „	...	...	200 camels plus 28 to carry 7 days' supplies.*
Total	...	...	802 camels.

* At 7lbs. per camel per diem, including grain for the animal and share of rations for the driver.

The diagram following shows the daily movements of these 802 camels, the numbers moving out and returning over each march, and the date of return of the convoy used for each post.

No. of Post	Days of movement						
	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th
No. 4.							
No. 3.				228			
No. 2.			429				
No. 1.		622					
Base	802						

The use of this form of diagram is convenient alike to the transport and the supply officer. From it the former can watch the movement of transport and date of its return to the base; the latter can see at a glance the date when each post was last filled up and after what interval replenishments are approximately due. If replenishment of stocks is maintained by these direct convoys and it is assumed that the stock is to be kept up to the level of 15 days' supplies, there will be small convoys for each post, in relays, corresponding in number to the number of days occupied in going to and returning from each point.

Therefore 2 relays are required for the 1st post: 4 relays for the 2nd, 6 relays for the 3rd, and 7 relays for the 4th.

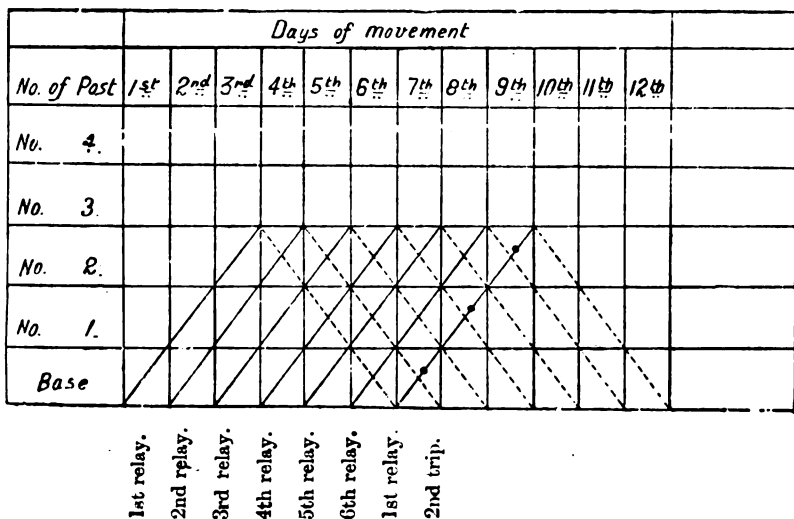
If at Nos. 1, 2, and 3 posts, the daily consumption is 60 maunds, and at No. 4 post 67 maunds, the number of camels required will be—

For No. 1 ...	... 12 × 2	or 24 camels.
Do. 2 ...	... 13 × 4	„ 52 „
Do. 3 ...	... 14 × 6	„ 84 „
Do. 4 ...	... 16 × 7	„ 112 „

Total ... 272 camels.

and 55 camels should be sent out daily or 12 + 13 + 14 + 16.

The attached diagram illustrates the system of working the relays for stocking the 3rd post, as an example of the general method.



It has been explained how the conveyance over the line of communication of a supply of fodder to the troops and transport at the front impairs the power of the transport on lines of communication to maintain forces operating in the theatre of war.

The figures in diagram No. 2 exhibit the effect on the staging transport of the need for providing fodder for consumption at the post on the lines of communication.

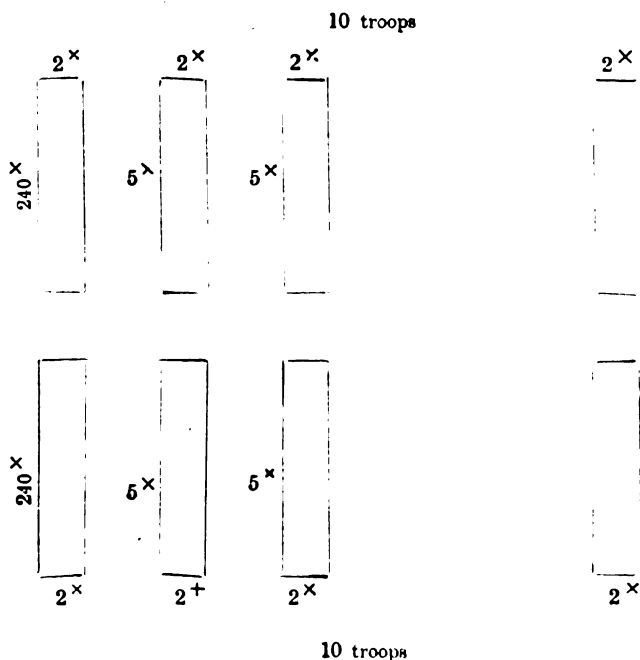
14. The provision of a proper water-supply for animals in hard work is of the greatest importance, if they are to maintain condition. In hot weather

it is essential to supply the transport with water at the exchanging stations. The ordinary requirements may be taken as 10 gallons for each animal and two gallons for each man daily: and it will usually suffice to provide at the meeting point $\frac{1}{4}$ gallon per man to enable them to fill up water bottles and 3 gallons per animal as a refresher. The balance must be provided at the permanent camps.

15. It is important to have sufficient space at exchanging stations to allow carts to be parked in a regular manner, so as to hasten the process of exchange, prevent confusion and facilitate check of loads by officers when handing over charge to one another. The following would be a convenient method:

Park the carts in mass of columns of troops, each troop in a bullock train having 40 carts, with a depth of 6 yards per cart and intervals of 5 yards between each troop in column in the mass,

twenty yards should be allowed between the two bodies of carts which meet. Hence the space required to allow two bullock trains to meet, which means the transmission of 4,000 maunds of stores (the carrying power of each train) would be as follows:—



$(240 \times 2) + 20 = 500$, or the depth of the two bodies facing each other.

$(2 \times 10) + 5 \times 9 = 65$, or the frontage of each body.

Or if the two bodies were drawn up alongside each other, the space would be 240 by $[(2 \times 65) + 20]$ or 240 by 150.

16. The space at permanent camps must be greater, otherwise the conditions become unhealthy, and provision must be made for tents of the personnel, workshops and sick lines.

Permanent Camps.

If more than one unit of transport is stationed at a camp, each should have its separate site.

It would be probably inconvenient to use any of the carts in such cases as a laager for defence: getting them in and out of position would delay the loading of stores, and dependence on such an arrangement would be a source of danger when the train returned late in the evening, leaving the camp wholly or partially unfortified at dusk. It would therefore be best to fortify it in the ordinary manner.

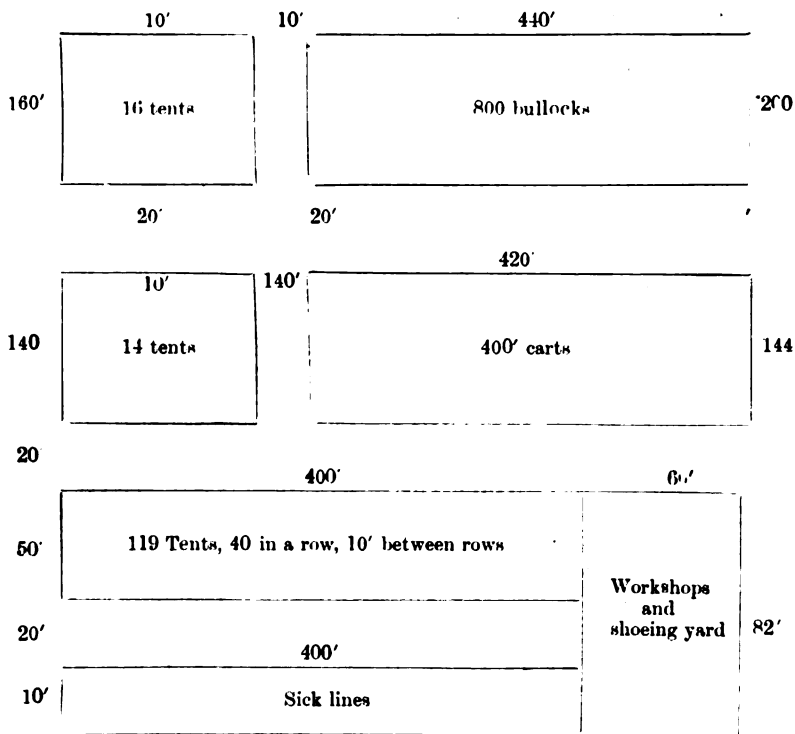
A bullock train is formed in 10 troops and has 400 carts, 880 bullocks, 559 men and 149 tents.

A convenient method of arrangement would be the following:—

Picket the bullocks in troops of 88 animals in line, allowing each animal 12' depth and 5' frontage—form double lines of troops, 6' way between troops and 10' way between double troops for movement of attendants.

Park the carts in double lines in blocks of 40 back to back, tipped, poles upwards and outwards; allow for each cart 12' × 7' and 20' space between double rows to allow room for yoking cattle. Space for each tent may be taken as 10' by 10'.

The plan of the camp would then be somewhat as follows:—



Total area 460' by 401', or in round figures 150 yards by 130 yards. The arrangement provides for a proportion of drivers living near the bullock lines and puts the sick lines as far as possible from the working animals.

17. It is convenient, more particularly in working out schemes and making rough calculations for feeding troops, to be able to consider only the number of fighting men, and to be relieved of the necessity for making in each case minute calculations of the number of followers and animals, and the weight of the rations.

A tabular statement is appended, as an example of calculations that any officer can work out for himself from the data given in the Field Service Regulations, India, 1906.

The principle is adopted of taking the fighting man as the unit, and calculating the proportion, in decimals, of followers and animals to each fighting man. As a further convenience the total weight of one day's rations for men, and one day's grain for the animals of the whole unit is given, as well as the average grain ration per head of the total mass of animals, both transport and regimental, in the unit in question. A good deal of trouble is saved and the result is sufficiently accurate for the purpose in view.

18. As an example of the use of this method, apply the figures in the table to the case of, say, 500 British Infantry. These 500 fighting men, therefore will be probably accompanied by $500 \times \cdot 24$ followers, and $500 \times \cdot 315$ animals of all sorts; so the party will consist of 500 troops, 120 followers, 157 animals; and their rations and grain for one day will weigh—

	lbs.
$500 \times 3\frac{1}{2}$ lbs * for troops	or 1,750
$120 \times 2\frac{1}{4}$ lbs. for followers	„ 270
157×6 lbs. for animals	„ 942

Total ... 1,962 or $22\frac{1}{2}$ mds.

For schemes dealing with larger bodies of troops, tables of the same nature can be constructed to apply to divisions and brigades of the normal composition.

For example, in an Indian Infantry division, the corresponding ratio is, to 1 fighting man, $\cdot 46$ followers and $\cdot 60$ animals: the average grain ration is $6\frac{1}{4}$ lbs. per animal per diem, and the men's rations, all round, are approximately $24\frac{1}{4}$ lbs. † per day.

So, if the question be to estimate the provision necessary for feeding 30,000 troops, in the formation of an Indian Division of all arms, it will be seen that with these troops there will be approximately—

$30,000 \times \cdot 46$ followers	or	...	13,800
$30,000 \times \cdot 60$ animals	or	...	18,000

and their daily consumption of rations and grain will be —

Fighting man	$30,000 \times 2\frac{1}{4}$	...	67,500 lbs.
Followers	$13,800 \times 2\frac{1}{4}$	...	31,050 „
Animals	$18,000 \times 6\frac{1}{4}$	...	1,15,200 „

Total ... 2,13,750 „
or 2,672 maunds.

19. It is hoped that these notes may give some idea of the nature of the questions that affect Line of Communication Transport, and may show how, by the help of a little previous calculation, a great deal of minute work in connection with questions on this subject can be dispensed with without any material loss of accuracy in the result.

* Tinned meat and biscuit.

† The normal arrangement (*vide* Appendix vi F. S. Regns., India, 1906) provides for carriage for British Troops, of —

2 days' tinned rations @ $3\frac{1}{2}$ lbs. per day.

5 days' fresh rations @ $1\frac{1}{2}$ lb. per day.

So that a week's rations weigh ($3\frac{1}{2} + \frac{1}{2}$) lb and the average per diem is $2\frac{1}{2}$ say $2\frac{1}{2}$ lbs.)

DIAGRAM I.

Movements of animals (Bullocks). Staging Tables, 1,000 maunds forward daily, *plus* rations for staging animals, excluding fodder and fuel.

Base.	1st changing station.	1st intermediate stage.	2nd changing station.	2nd intermediate stage.	3rd changing station.	Terminal	REMARKS.
200	1,000 mds.	200 + 200 = 400	1,000 mds.	200 + 200 = 400	1,000 mds.	200 mds.	200 Carrying loads for onward continuous transmission.
20	96½ mds.	39½ mds + 57 = 96½ mds.	67 mds.	20 + 12 = 32 + 18½ = 50½ mds.	18½ mds.	4 mds.	4 Carrying supplies for maintenance of staging transport and themselves and spare animals.
* 74		22		21		11	11 Spare animals.
294	{ 440 animals meet here with 238 men.	454	{ 424 animals meet here with 228 men.	437	{ 408 animals meet here with 220 men.	215	Total animals employed. Weight in mds. of one day's supplies for total animals employed at the stage.
		39½ mds.		38½ mds.			
100		100 + 100 = 200		100 + 100 = 200		100	100 Carts carrying stores delivered at terminal.
10		10 + 6		6 + 2		2	Carts carrying supplies for stage transport.
110	220 carts meet.	216	212 carts meet.	208	204 carts meet.	102	Total carts at each point.

* 52 balance of spare animals required for the line + 22 or 10% spare on those working out from the base.

DIAGRAM II.

Movements of animals (Bullocks). Staging Tables, 1,000 maunds daily with grain and half (8 lbs.) fodder ration, for staging animals.

Base.	1st changing station.	1st intermediate stage.	2nd changing station.	2nd intermediate stage.	3rd changing station.	Terminal.	REMARKS.
200	1,000 mds.	200 + 200 = 400	1,000 mds.	200 + 200 = 400	1,000 mds.	200	Carrying loads for onwards continuous transmission.
44	219½ mds.	44 + 26 = 70	25½ + 41½ = 127 mds.	26 + 9 = 41½	41½	9	Carrying supplies for maintenance of staging transport and themselves and spare animals.
	Meeting of 488 animals.		Meeting of 452 animals.		Meeting of 418 animals.		
* 81		24		22		11	Spare animals.
325		494		457		220	Total animals employed.
	* 25 10 spare at base 56 balance spare at base. 81	92		85½		41½	Weight in mds. of one day's supplies for total animals employed at the stage.
100		100 + 100 = 200		100 + 100 = 200		100	Carts carrying stores delivered at terminal.
22		22 + 13 = 35		13 + 4 = 17		4	Carts carrying supplies for stage transport.
* 22		235		217		104	Total carts at each point.

Corresponding movements of carts.

Table showing proportion of followers and animals to fighting men in various units, and weight of daily rations
(*vide* para. 17 of letter press).

	1	2	3	Total of Cols. 2 and 3.	Animals.	Rations, for men.	Grain for animals.	Average ration per head of all animals.
				4	5	6	7	8
British Cavy. Regt.	...	·236	·253	·49	1·61	Mds. 19·75	Mds. 81·75	lbs. 8·53
Native Sill. Cavy.	...	·28	·107	·387	1·49	20	70	7·3
Battery R.H.A., Q.F.	...	·59	·214	·804	2·06	8·375	39	9
Battery R.F.A., Q.F.	...	·614	·107	·721	1·7	7·5	31	9·23
Brit. Mtn. Battery	...	2	·213	2·213	2·4	10·375	21·25	6
Nat. Mtn. Battery	...	·284	·08	·292	1	10	18·75	5·7
Co. Sappers and Miners	...	·15	·18	·33	·517	7·5	8·75	6·5
Battn., Brit. Infy.	...	·13	·11	·24	·315	16	19·625	6
Battn. Native Infy.	...	·11	·1	·21	·29	26·125	17·125	6
Do Pioneers	...	·116	·115	·231	·36	26·75	20·625	6
Brit. Field Hospl.	...	8·4	2·15	10·55	5	8·5	10·25	6·3
Nat. Field Hospl	...	4·5	1·25	5·75	3	7·375	9·5	6·3

OUR NATIVE OFFICERS.

BY VERB SAP.

There have appeared of late in several journals and periodicals articles and letters written by persons in a position to know their subject, with a view, if not to disparage, at any rate to indicate room for improvement, in the existing system of promotion to the native commissioned ranks of our Indian Army.

It would seem that those who advocate some change in the present system of regimental selection and promotion are, for the most part, arguing under an exaggerated idea of the importance of many of their arguments: and also that the mere production of some of these arguments tends rather to bring a *prima facie* case not so much against the Native Officers as against those who share the responsibility of his creation.

A writer in the April 1907 number of this Journal points out that the requirements of modern warfare tend to throw an ever-increasing responsibility on the Native Officer, and call for the exhibition on his part of a much larger initiative and self-reliance than he can at present be credited to possess.

What of this is true for the Native Officer is in reality no truer for him than for all the other units of a modern army. In fact it is a moot point whether, under existing conditions, when so many British Officers are always present with a Native Regiment, the truth of this remark in the special implication is as apparent as in days gone by.

In dealing with the question under discussion it is not easy to keep to the point under notice at the moment, and a short reference to the various matters that seem to call for notice, as they occur, may better give one's ideas on the whole subject.

Responsibility and initiative are not subjects that can be taught at a college, but abstract qualities born and bred in a man. To bring these qualities forward in sufficient prominence, the only method is to afford frequent opportunities and ample encouragement to the young Native Officer to practise himself in the exercise of them. Eventually, by degrees, we shall reap the required result.

One need say little here to show how many of the regulations tend to dwarf a Native Officer's vision of his field of action.

"A Native Officer may, if his Commanding Officer think fit, be permitted to superintend the practices in Part I of Individual Musketry Practice on the Range."

In effect with so many British Officers always present to what is a Native Officer reduced on many occasions? A Non-Commissioned Officer? Yes indeed.

But it is always open to the Double Company Commander, who has the thorough training of his Native Officer at heart, to say to him, "Jemadar Sahib, now that you are an officer and have your own responsibility for the training of your Company or Half Company, see that you command your Company or Half Company and do not look to me to do it. I shall be always on the look out and give you any help you may want, but I shall hold you responsible absolutely for the proper training and discipline of your command."

Mistakes on parade and field days must be expected from the young Native Officer, and not from him alone. But these yield easily to patience and careful supervision.

Have we not often heard a Commanding Officer seriously regret the absence on leave or what not of several of his British Officers when a field day or manœuvres are on the tapis? What are these field days and manœuvres but so many opportunities for the progressive training of all ranks? Is not the whole of army service but so much progressive training and yet how many of us would treat each day as it comes as a final test rather?

No, this is all wrong. First of all let us realise that every day is a day of training and it is not perhaps *always* the Native Officer who may need it most.

Our Non-Commissioned Officer of to-day will be our Native Officer of to-morrow! Quite true. This simple fact adumbrates in the minds of would-be reformers most serious social defects and obstacles to discipline. Let them go, they only exist in Western imagination untuned to Oriental habit.

Take this truer view. The Native Officer has received his commission which he treasures far more than any Sandhurst cadet and it means far more to him. A few hours after his good fortune is made known to him, dressed in a faultlessly fitting new uniform of mushroom miracle growth with his sword at his side, he has visited his British Officers each in turn by seniority and received from each that friendly hand-shake and cheery word of encouragement which is worth more than any Utopian scheme of college training in making a useful barrier between his social past and his future prestige.

Sentiment lives still and properly fostered is pregnant with great things in our Native Army. A proper appreciation of the native character and an essential but not exaggerated pandering to the Orient in him, can still claim from the native ranks of our Indian Army the historic devotion of a Nicholson or a Hodson. There is no better asset.

The Non-Commissioned Officer's friends of yesterday are the Native Officer's friends of to-day! Are they? We need not concern ourselves until the improbable occurs of this fact leading to any misbehaviour being brought to our ears.

Suppose in our imagination the Native Officer for want of a Babu's training is in the hands of his Pay Havildar!

What this sentence would look like paraphrased we will not inquire too deeply—let him stay there, he is perfectly safe.

If he is *not* safe, from the fact of his being in a regiment where some sort of discipline is supposed to exist, he would be no safer had he achieved—the sometimes claim of educated distinction—that Oriental degree of “failed B.A. of University.”

Oh yes, indeed; let it be taken for granted that many little things do happen in a native regiment that never come to the ears of the Double Company Commander, which are settled by the Native Officer. How thankful we should be for this boon, nor lose sight of the fact that *Sirkari hukm* is the outer cover to a most useful parcel of *dustoor* and *bandobast*!

We have our future Native Officers with us long enough before promotion, also our Pay Havildars. We condemn ourself if we can generalise on their inefficiency for their parts.

The well marked line of social distinction between the native commissioned and non-commissioned ranks that one sometimes hears of: what is it but one of the white stones we are looking for to shy at!

Our favoured treatment of the individual plus his commission is quite enough. Nor is there, except in our imagination, any such line we could find if we were to look for it.

The only preventive of so-called *bhaibandi* and patronage is for the British Officers concerned to know their men and to command their part and to leave no room for unworthy relatives of this or that Native Officer to be rewarded with promotion that is not their due. And to truly show that your Native Officer is worth his salt, he must not be driven to the other extreme of refusing to recommend his friends and relations fit for promotion for fear of reprimand. After all we must do all we can to foster every legitimate aid to the Native Officer's personality.

Wherever there is promotion by selection there must always be some heart-burning, but this is only temporary. A system of probationary appointment any one who knows anything of the native mind must recognise at once as out of the question. A Lance-Naik reverted to the ranks as not likely to become a good Non-Commissioned Officer must often seek discharge, as his only remedy for his loss of self-respect! A man who has been tried for a year as a Jemadar and found wanting—for to try him as a Jemadar he must have been granted all the rank and privileges—is unthinkable of as a Non-Commissioned Officer again.

The exceptional case of the direct commission proving a success is the last nail in the coffin of *that* for a general rule. To find the educated youth of good family in numbers sufficient to fill our native commissioned ranks with a satisfactory article is impossible, even if advisable. We ought to know there is no *viâ media* for us between our present system, and the really authentic native gentleman who is gradually getting brought to light as the Imperial Service Cadet. And even now through this undertaking it is conceivable that the authorities are beginning to have a fellow feeling for Sindbad the Sailor.

It would seem that the present system of appointment and selection is quite good enough. It is in the manipulation of the system that error, if any, must be looked for.

Dismiss the idea of the training school for future Native Officers. If we cannot do this in our regiments it were better far to begin to think of some other methods than competitive examinations and Sandhurst. What *does* happen after a Non-Commissioned Officer has been made a Jemadar?

Does his Commanding Officer and every other British Officer bear in mind for some time that he is a square peg and that it is they and they alone who are responsible if he is not symmetrically rounded?

Does it not very often happen that the British Officer is at first disappointed with his creation, and forgets that it is his duty to make the best of a possible bad job? It is almost criminal to suggest we can have selected for a commission a man wholly impossible: therefore we have but to sit down to our task and try and try again until with patience we have succeeded.

It is unfortunate that the training of brigades and armies must go hand in hand with the training of individuals.

Our higher ranks must be allowed, and frequently too, a sufficiency of troops with which to manœuvre in order to have every facility to complete the course of their own higher education.

Garrison duties, escorts and fatigues of all kinds interfere seriously with the energies of officers and men alike and take up their time. Hence the necessity of letting slip no occasion for instruction.

At camps of exercise, at field days, on Commanding Officer's parade the Double Company Commander has his chance. It is easy to make many other opportunities to get at the man we are trying to teach, but we must not interfere unduly with his leisure.

The material to hand is excellent. Are we making the best of it? If there is really any question as to the necessity for an open discussion as to the education of our present Native Officers and their capacity to fill the posts and do the duties required of them, then it would seem our only honest answer is that not only are we not making the best of the excellent material but that we are either wilfully or ignorantly—which is worse?—neglecting to make the best of it.

We give him a commission, we call him a Native Officer, we own he must have responsibility and initiative.

How many Commanding Officers ever give this matter even a thought?

If it is on the range a British Officer must always be present, and our Native Officer from his training will sit down with his N.-C. O.'s and patiently wait the arrival of the 2nd-Lieutenant with one year's service who does not even know how to recognise him as a Native Officer.

If there is match shooting a British Officer must be on the butts.

If fifty men are wanted to fill in old shelter trenches, or many another fatigue, a British Officer must superintend the Native Officer detailed.

In fact the British Officer is made to dwarf the Native Officer almost out of existence.

What we have to hit in our instruction is the happy mean where we can instruct both at the same time without undue prejudice to the chief requirements in the education of either.

At present the Native Officer is, so to say, swamped out by the numbers of British Officers, and there is little of responsibility or chance of exercising his initiative that can fall to his lot. It is not many years ago when a Subaltern of a few years' standing often commanded his regiment on a field day. Then, indeed, in those days there was no excuse for any one that he had no practice in exercising command. Nowadays what do we find? A Subaltern in command of his regiment ever! Not so, but senior Majors commanding each Double Company is the order of the day. Truly the hands of the clock have been revolving to some purpose.

So that as well as a glut of British Officers, we have also a superfluity of senior officers doing the work now that they have done for many years dating back to the days when they looked to be commanding regiments at the present times, judging by their then contemporaries.

No one can complain of the establishment of British Officers—let it go on increasing. This is the sign of the times.

Furlough is encouraged. Even with as many away as may go there are more than enough always present for all regimental training.

We do not want to be deprived of our work, there is none too much of it as it is, but the necessity for the presence of more than three or four British Officers on parade never existed where the Native Officers were properly trained; and their presence as a general rule is to interfere to a great extent with that part of the Native Officer's education, that essential part, where he can really let himself out as being responsible for his own small command and not too likely to have his initiative interfered with.

What is wanted is for the Native Officer to be taken seriously. He is an officer and must receive an officer's treatment unimpaired by any regulations casting aspersions on his claim to be trusted, and anachronisms like the haunting conviction of those who make rules and regulations that they must always be on the look out for malpractices must be consigned to the limbo of the periwig.

A General Officer not long ago was inspecting a Half Battalion, and thought he would like to see an attack carried out by the Native Officers on their own initiative and responsibility.

He called them up, showed them the hill a mile away that had to be taken and told them all their British Officers were killed, and seemed thoroughly surprised when the Senior Native Officer present, after hearing the General's intention, at once saluted and asked if he should begin.

It was not an easy task set them. "Perhaps you had better just explain what I want of them again," said the General to the Senior British Officer.

"Quite unnecessary, General; they know their work and I can depend on them" was the reply.

And after watching the attack carried through, the Native Officers received the mead of praise they earned. "I could not have made better dispositions myself," said the General.

Let us leave the system of appointment of Native Officers where it is, it cannot be improved on; and when we can say the same of the method of their education we shall not hear many cavillers for change. It merely behoves each regiment to take the special training of newly appointed Native Officers seriously.

PRESS-CENSORSHIP IN WAR.

By LIEUT. T. C. W. FOWLE, THE ROYAL MUNSTER FUSILIERS.

Those who read an article "The Press in War" which appeared in the *Broad Arrow* of Saturday, June 1st, 1907, may perhaps come to the conclusion that the present treatise on the same subject is unnecessary, that it has been dealt with, as far as such a large subject can be dealt with, in a single article, too recently to bear repetition. Far from this being the case it was that very article which has given birth to this one. It was because the *Broad Arrow* in that leader, for leader it was, expressed opinions which are at variance both with existing military opinion, and with the parts of history, that I have ventured to take up the cudgels in the opposite camp. These opinions are all the more noteworthy because they emanate from such a paper as the *Broad Arrow*. If they had been put forward by some political paper they would not, dealing as they do with restrictions on news—the very life of a paper—be worthy of so much attention. But they come from the *Broad Arrow*, a military paper imbued with military ideas, one of the foremost military organs in the world, a paper which has always, up to now, advocated military efficiency cost what it may, and which has always put the safety of the Empire and the success of our arms in the field before the convenience of the individual. Since therefore the *Broad Arrow* expresses such views, it follows that there must be a strong party who agree with them, and it is, therefore, all the more necessary to combat these heresies, if I may be allowed to use such a strong term.

The first sentence of the leader contains what is, in my opinion at any rate, the wrong presumption. "The Government intends to introduce a Bill dealing with the control of the Press during war time, but we cannot but believe that the Press itself will act in such a case with sufficient patriotism and reticence to render any official muzzling order unnecessary."

I am afraid that I have not that simple faith in the "patriotism and reticence" of the Press which the *Broad Arrow* possesses. If somebody were to say to me "Surely you don't doubt the patriotism of—or the——?" I should answer "Certainly not, but I do doubt their reticence." But if the same person were to continue and say what about "The——and the——" I should have to answer "That reticence they have none, and their love of News (spelt with a very big N) is considerably greater than their love for their country." I will give reasons for the "faith that is in me" later on.

The point to be considered is—to what extent do the newspapers in time of war give valuable information to the enemy? If we can prove that in previous campaigns they have provided the

enemy with this information, it is rather an obvious conclusion that in our next war they should be prevented from doing so.

During the war of 1870, the German papers maintained an admirable attitude of reticence. Any information which von Moltke thought could be published with safety was given to those papers which obeyed the Government's mandate as to suppression of important information. The agents of the French Government could glean little or nothing from the perusal of the German Press.

Far otherwise was it with the French newspapers. Every scrap of information that could be obtained in any way was published for the entertainment of the good people of Paris. Two examples will suffice to show the information which was given to the German General Staff by this reckless conduct. At the beginning of the war, owing to the confusion in which the French army was, von Moltke could obtain very little information as to the various corps, etc., which made up the armies which were opposing him. The French newspapers however published here and there the movements of the corps. This news was telegraphed to London by the various German agents in France, and from London, by the same means, was telegraphed to Berlin. By piecing these scraps of information together, the German General Staff was able to get a very fair idea of the forces opposing them. Example the second. The news that MacMahon was marching to relieve Bayane in Metz, news which should have been kept absolutely confidential, news the publishing of which must have been entirely fatal to whatever chance of success MacMahon might have had—and the God of Battle knows that they were little enough—this news was actually published in the *Temps* newspaper in Paris. Result, it was copied in the *Times* in London, and immediately telegraphed to Berlin, from whence it went to Army Headquarters. Von Moltke assured of MacMahon's advance was able to order that gigantic wheel which was finally to surround the French army at Sedan and crush it to powder.

Are we then to suppose that the French Press was less patriotic than the German? Surely not. Only in one case the Press was kept in order, in fact censorship was exercised, and in the other case it was not. It is not to be supposed that the editor of the *Temps* was more unpatriotic than his fellow citizens. He merely published a piece of news which he thought was harmless, which he knew would raise the spirits of his readers, and which was, on the face of it, a distinct coup for his paper.

Then in the Boer War. The censorship in this campaign was of the lightest description. Our newspapers were filled daily with all the movements, either taking place or projected, in the theatre of war. It was a well-known fact, commented on at the time, that the Boers got a large amount of valuable information from our newspapers. Yet though he commented on it the "man in the street" still clamoured for news. The plans of a General might be hinted at one day, nay more, might be plainly revealed. The man in the street was much interested, and of course criticised them freely.

He did not seem to realise that there were other people in London that morning who were even more interested than he was, whose business it was to make a digest of those plans, and, by round-about ways, get the information to the Boer Headquarters. When the "man in the street" read a week or so later in the same paper that General So-and-So had had to considerably modify, or abandon altogether, the plans which he had made "owing to the fact that the Boers had unaccountably received information about them" the "man in the street" was rather upset, but, in nine cases out of ten, never connected the "cause and the effect."

Can anybody say that during the Boer War our Press were reticent or, in a few cases, even patriotic? I think not.

With regard to the Spanish-American War (to go back some years) Mr. Cowen, War Correspondent of the *Daily Chronicle*, says:—

"I know how the correspondents in the Spanish-American War, in their eagerness to outdo each other, wired information which was of the greatest use to the enemy. From Manila went telegrams which appeared in New York, and were wired back to the Junta Filipina in Hongkong, to be smuggled over to the Philippines again; and this happened not once, but all the time." So much for the reticence or patriotison of the American Press.

The value of strict censorship was never better displayed than during the Russo-Japanese War. It will be remembered how that when all the War Correspondents flocked to the seat of war they received absolutely the minimum of information which they could extort, from their extremely polite, but very taciturn, companions—the Japanese. It will be remembered how they were never permitted to go to the front, and it will also be remembered what excellent articles they used to write, presumably to show that they were alive, since the said articles contained remarkably little war news. It will also be remembered what a lot of nonsense, if I may use the word, was talked both by the correspondents (there were of course notable exceptions) and the general public, about this restriction of news, as if war was a sort of game, played in order to give correspondents a living and the general public a relish for their breakfasts.

I do not think that I can show better how necessary these restrictions were, and how, in spite of the censor, valuable information was given to the Russians by our newspapers although Japan was our ally and Russia was not, than by making a somewhat long quotation from "The Russo-Japanese War" by Mr. Cowen, to whom I have already referred. Mr. Cowen's testimony is all the more valuable because he was one of the correspondents during the war, and if he, a War Correspondent, is certain that the Japanese censorship, which deprived him of news, was absolutely necessary, better evidence cannot be obtained.

Here is the quotation:—

"The Japanese authorities knew the danger of letting anything out. It was said by many of the newspaper correspondents who

crowded to Tokyo at the outbreak of war that there ought to be no restriction on the publication of such items as would not help the enemy; but that is an easy thing to say and an almost impossible one to carry out. There is in the long-run no sort of news that a correspondent could give his readers without conveying some hint to the enemy. There may perhaps be some interesting items that would do no harm, but one never knows, and it is best to be on the safe side; there is no time to sift and sort out the myriads of items that the ingenuity of a hundred keen writers might bring forth. It is not only the "yellow journals" that are to blame. Even the *Times*, for instance, published on February 29th (1904), a Chemulpo message, which went to Weihaiwei by wireless telegraphy, stating that 'the Japanese disembarkations during the last few days have been confined to supplies, the transport corps, and ponies of which there are 4,500. The total number of troops landed is 20,000 including the Twelfth Division and part of the Second Division. Another disembarkation, believed to be on a small scale, is taking place on the coast immediately south of Haiju, whence the troops will advance parallel to the Peking road, thus effecting a gain of five days' march. It supposed that 8,000 troops with a few guns are now advancing beyond Seoul towards Pingyang.' And a great deal more of the same sort. All such information may be meant in the most innocent way, merely for the edification of the 'man in the street,' in London or elsewhere; but St. Petersburg, of course, has its Intelligence Department, too, and was collecting every clipping that might be of use, and wiring out all possible data to the commanding officers at the front."

The value of the information, published on February 29th, to the Russians, needs no pointing out. The examples which have been given above prove, I think, that in ninety-nine cases out of a hundred neither the patriotism nor the reticence of the Press withstands the temptation of giving the latest news to its readers. These examples do more. They prove that the argument which is so often brought forward against censorship of the Press, namely, that journals whose patriotism is above suspicion (they are, alas, remarkably few) can be trusted not to make the mistake of publishing news which may be of assistance to the enemy, that this argument is without foundation. The Editor of the *Temps* when he gave information to the Germans in 1870 of MacMahon's march to relieve Bayanne never dreamed he was betraying his country; the English papers, the best of them that is, had no idea of the help they were giving to Boers in the war of 1899-1902 by publishing the reports of their correspondents verbatim; the Editor of the *Times* had no idea, it is inconceivable that he could have, of the valuable information he was giving to Russia, the enemy of our ally, when on the morning of the 29th of February 1904 he published the information which I have quoted.

At this point I should like again to touch on the article in the *Broad Arrow* to which I have already referred. Another argument which the *Broad Arrow* brings forward against censorship is public

opinion. The writer suggests that the public have become so accustomed to having the news of the world at their breakfast tables that they would not permit any infringement on their rights in this direction. Moreover he goes on to say that the great newspapers have established a reputation for early and accurate news, which reputation they are bound to keep up in war. These last two arguments, *i.e.*, public opinion and the reputation of the journals, it would be difficult to treat seriously were they not written down in black and white in such a journal of note as the *Broad Arrow*.

The foundation on which they are fixed is evidently the idea, unfortunately very prevalent in England, that war is a kind of very risky game, which only concerns a small portion of the population, *i.e.*, the army, that this game can be watched with perfect safety (like a football match) by the remainder of the nation, that the duty of the nation stops short at providing the funds and raising a few volunteer corps, and that, in the meantime, the ordinary affairs of life, for the ordinary citizen, must go on as per usual. Our recent campaigns have, of course, strengthened this view. Our campaigns on the North-West Frontier of India, in Egypt, in South Africa, have all been fought far away from the Houses of Parliament. The citizens of London, unlike those of Paris, have never known what is to be besieged; have never known what martial law is like; have never waited, in the bitter winter mornings, rich and poor together, in long shivering queues for the dole of the day's bread. Our peasants have never known what it is like to have invading cavalry quartered in their villages, have never known what it is like to reap in order that they, while starving, may feed the enemies of their country. In other words, the people of England for the last two centuries have never known the horrors of war.

When we consider that in our next great war we shall be fighting, not for this or that piece of territory, not for a misunderstanding here or *entente cordial* there, not even, I venture to say, for the national honour, but for the national existence; when we consider that we shall be making far greater sacrifices, both as individuals and as a nation, for the success of our arms, than the mere doing without our *Morning Post*; when we consider that in all past campaigns neither patriotism nor reticence, nor discrimination has prevented the Press from giving information to the enemy; when the only arguments against censorship are vague platitudes as to the "freedom of the Press," "patriotism of the newspapers," "force of public opinion," "reputation of the great journals," and so forth; when we set against these sentimentalities the "majesty of facts," and consider that what our newspapers did in our last campaign, so will they do in the next! When we do this, we can come to but one conclusion that Press-censorship is absolutely necessary in war.

THE IMAGE OF WAR.

BY MAJOR R. G. BURTON, 94TH RUSSELL'S INFANTRY.

From time immemorial there has been an intimate relationship between sport and war, dependent on the recognition of the value of big-game hunting as training for the soldier.

The hunting of dangerous game may, in fact, be termed the image of war, demanding for its successful pursuit not merely the courage of the common soldier, but many of those attributes which go to make the leader of men. Among savage or semi-civilized races this has always been recognised. The Red Indian, the Zulu, the Mogul conquerors of Asia, the Boer—all these have profited by and known how to appraise the hunter's craft at its true value. Among the Red Indians of a past generation, of whom in the days of our youth we read with delight in the stirring pages of Fenimore Cooper and Mayne Reid, we find the prowess of the hunter no less revealed by his necklaces of bear's claws than that of the warrior whose trophies were the scalps of his enemies. Changiz Khan who with the Golden Horde overran the old world from the Pacific to the shores of the Caspian Sea, Taimur who devastated Asia, and Babar who founded the Mogul Empire in India—all these and many others among the kings of men regarded sport as military training no less than as an exciting recreation. These conquerors of old were in the habit of organising great drives for game, carried out by the "hunting-ring" formed by their armies, much on the same plan as the drives organised by Lord Kitchener for the reduction of the Boer partisans in South Africa, which were based on principles similar to those adopted in a beat for tigers. The same system, with the use of blockhouses, was employed by Haider Ali and Tipu Sultan in the reduction of Coorg, whose savage men, resembling wild beasts in cunning and wood craft, could not be otherwise subdued.

But among western civilized nations, with the exception of Russia, the military value of the qualities of the hunter have never been appreciated, perhaps owing to the comparative scarcity of game in Europe. But it is strange that we have imported the same ideas into India, where such great facilities for sport exist, but where the hunter of big game is accorded no recognition and little consideration. The utility of hunting expeditions in developing the qualities of the soldier has long been recognised in the Russian army, where there is a fixed establishment of selected scouts (*okhotniki*), an important part of whose annual training consists in expeditions in pursuit of wild beasts. The present writer, during an extended residence in Russia, had the advantage of watching these men at work, and observing how much they gained in the qualities of value to the scout by this branch of training, which involved useful practise

for the officer in charge who had to organise all the arrangements connected with the expedition. In the campaigns of the Caucasus and in the Russo-Turkish war of 1878, these trained *okhotniki* proved of inestimable value as the eyes and ears of the army, and in the execution of dangerous and desperate enterprises.

Innumerable instances of a similar nature might be gathered from a knowledge of the personality of those who took part in the raids and forays of the American Civil War, and from the records of the frontier fights with the Indians during the earlier years of the settlement of remote tracts of America. To quote a more recent instance, an eye-witness describing the advance of the American rough-riders under a heavy fire at the fight at Gausimas in Cuba during the recent Spanish American War, relates—"It was easy to tell which men were used to hunting big-game in the west and which were not, by the way they made their rushes. The eastern men broke at the word, and ran for the cover they were directed to take like men trying to get out of the rain, and lay panting on their faces while the trappers and hunters slipped and wriggled through the grass like Indians, dodging from tree-trunk to tree-trunk and from bush to bush. They always fell into line at the same time as the others, but they had not exposed themselves while doing so." These are just the kind of men we require for scouting, and for the attack under the difficult conditions of modern war—men accustomed to take advantage of every feature of the ground, as the big game hunter does in stalking his quarry. The untrained scout will march straight to the top of a hill; the hunter will arrive there behind a bush or stone, and make his observation *from one side* of the cover, without revealing his presence to the most cunning animal or most watchful enemy. Preceded by a screen of scouts, trained in the pursuit of game, troops could move across country, free from the apprehension of falling into traps set by a wily foe, and we would have no more surprises of men marching in close order into the midst of a murderous hail of bullets.

It is of course impossible for all soldiers to shoot big game, but there is no reason why parties should not go out with their officers on extended expeditions, to act as shikaris, trackers, beaters, or "stops" in the drive. From the earliest times India has been famous as a land affording ample pastime for "the mighty hunter before the Lord." *Baber, first of the great Moguls, pursued the rhinoceros

* In the *Memoirs of Baber* the following account of a tiger-hunt near Peshawar is given:—"Early in the morning we marched from our ground. Where the road separates from the river, we heard a tiger howling, and it soon issued forth. The moment the horses heard the tiger's roar, they became unmanageable and galloped off with their riders, plunging down the steep and precipices. The tiger retreated again into the jungle. I directed a buffalo to be brought, and put in the wood for the purpose of luring him out. He soon issued out again roaring. Arrows poured down on him from every side; I, too, shot my arrow. When Kalwah Piadeh struck him with a spear, he twisted, and broke the point of the spear with his teeth, and tossed it away. The tiger had received many wounds, when Baba Yesawal, drawing his sword, approached, and struck him on the head at the moment he was on the spring. After this Al Sistani struck him on the loins, when he plunged into the river, where they killed him.

and tiger on the banks of the Indus; and his great successor Akbar was constantly on hunting expeditions. This great monarch saw in hunting other objects besides the pursuit of pleasure, as may be gathered from the following passage from *Bernier's Travels*—"Superficial, worldly observers see in killing an animal a sort of pleasure, and in their ignorance stride about, as if senseless, on the field of their passions. But deep inquirers see in hunting a means of acquisition of knowledge, and the temple of their worship derives from it a peculiar lustre.

This is the case with His Majesty (Akbar). He always makes hunting a means of increasing his knowledge, and besides uses hunting parties as occasions to inquire, without having first given notice of his coming, into the condition of the people and the army. He travels *incognito*, and examines into matters referring to taxation, or to *Sayarghal* lands (lands granted for benevolent purposes), or to affairs connected with the household. He lifts up such as are oppressed, and punishes the oppressors. On account of these higher reasons, His Majesty indulges in the chase, and shows himself quite enamoured of it.* Short-sighted and shallow observers think that His Majesty has no other object in view but hunting, but the wise and experienced know that he pursues higher aims." Here is an example for the emulation of our Viceroys!

The successful artifices and natural cunning exhibited in war by savage races are learnt from the book of nature, from the savage beasts to whose natural habits and instincts of self-preservation in the struggle for existence they have had to adapt their stratagems. The hunter pits his cunning against that of the wild animal he pursues. Those who have been accustomed to wander in the jungle in search of game, observing tracks and other signs of the animal's presence, keeping a constant look-out in every direction, listening for the snapping of a twig, detecting a footfall on a dry leaf, or the twitching of an animal's ear in the thicket, know by experience how the senses become sharpened and ever on the alert. Nothing escapes the eye of the hunter. A novice may look in vain for a track where a disturbed stone or the nibbling of a plant or bamboo-shoot betrays the presence of the quarry to the experienced eye. An animal standing motionless in the forest may be invisible to the young sportsman, but is plainly to be seen by the trained hunter. So much is this sharpening of the senses evident that in some of us a new sense seems to be born; we know by some natural intuition, probably due to a knowledge of what constitutes a likely locality or environment, that an animal is in a certain place before we see or hear it; we look, and there it stands on the expected spot.

But it is not only in nerve-training and in inculcating and quickening habits of observation and decision, that the practice of

* Jehangir inherited his father Akbar's love of sport, and in his memoirs gives many details of his hunting exploits. His game-book shows that between the ages of 12 and 50 he shot 17,167 head of game, including 86 tigers, 41 sparrows, 3,275 crows, and 10 crocodiles.

He did not seem to realise that there were other people in London that morning who were even more interested than he was, whose business it was to make a digest of those plans, and, by round-about ways, get the information to the Boer Headquarters. When the "man in the street" read a week or so later in the same paper that General So-and-So had had to considerably modify, or abandon altogether, the plans which he had made "owing to the fact that the Boers had unaccountably received information about them" the "man in the street" was rather upset, but, in nine cases out of ten, never connected the "cause and the effect."

Can anybody say that during the Boer War our Press were reticent or, in a few cases, even patriotic? I think not.

With regard to the Spanish-American War (to go back some years) Mr. Cowen, War Correspondent of the *Daily Chronicle*, says:—

"I know how the correspondents in the Spanish-American War, in their eagerness to outdo each other, wired information which was of the greatest use to the enemy. From Manila went telegrams which appeared in New York, and were wired back to the Junta Filipina in Hongkong, to be smuggled over to the Philippines again; and this happened not once, but all the time." So much for the reticence or patriotism of the American Press.

The value of strict censorship was never better displayed than during the Russo-Japanese War. It will be remembered how that when all the War Correspondents flocked to the seat of war they received absolutely the minimum of information which they could extort, from their extremely polite, but very taciturn, companions—the Japanese. It will be remembered how they were never permitted to go to the front, and it will also be remembered what excellent articles they used to write, presumably to show that they were alive, since the said articles contained remarkably little war news. It will also be remembered what a lot of nonsense, if I may use the word, was talked both by the correspondents (there were of course notable exceptions) and the general public, about this restriction of news, as if war was a sort of game, played in order to give correspondents a living and the general public a relish for their breakfasts.

I do not think that I can show better how necessary these restrictions were, and how, in spite of the censor, valuable information was given to the Russians by our newspapers although Japan was our ally and Russia was not, than by making a somewhat long quotation from "The Russo-Japanese War" by Mr. Cowen, to whom I have already referred. Mr. Cowen's testimony is all the more valuable because he was one of the correspondents during the war, and if he, a War Correspondent, is certain that the Japanese censorship, which deprived him of news, was absolutely necessary, better evidence cannot be obtained.

Here is the quotation:—

"The Japanese authorities knew the danger of letting anything out. It was said by many of the newspaper correspondents who

crowded to Tokyo at the outbreak of war that there ought to be no restriction on the publication of such items as would tell the enemy; but that is an easy thing to say and an almost impossible one to carry out. . . . There is in the long-run no doubt that a correspondent could give his readers without conveying a hint to the enemy. . . . There may perhaps be some of these items that would do no harm, but one never knows, and it is better to be on the safe side; there is no time to sift and sort out thousands of items that the ingenuity of a hundred keen writers might bring forth. . . . It is not only the "yellow journals" that are to be feared. Even the *Times*, for instance, published on February 20th a Chemulpo message, which went to Weihaiwei by wireless telegraph, stating that 'the Japanese disembarkations during the last week have been confined to supplies, the transport corps amounting to which there are 4,500. The total number of troops landed is 8,000, including the Twentieth Division and part of the Second Division. Another disembarkation, believed to be on a small scale, is taking place on the coast immediately south of Hapi, where the troops will advance parallel to the Peking road, thus effecting a march of five days' march. It is supposed that 8,000 troops with a few guns are now advancing beyond Seoul towards Pingyang. A large number of the same sort of reports are being sent to the British. All such information must be meant in the most innocent way, merely for the edification of the man in the street in London or elsewhere, but still, of course, has its Intelligence Department too, and was certainly being picked up that might be of use, and wiring out ad possit to the commanding officers at the front. . . ."

The value of the information published on February 22nd that the Russians needs no pointing out. The examples which have been given above prove I think that in ninety-nine cases out of a hundred neither the patriotism nor the reticence of the Press was a temptation of giving the latest news to its readers. These examples do more. They prove that the argument which is so often put forward against censorship of the Press, namely, that it is contrary to patriotism is above suspicion, they are also remarkably trustworthy, trusted not to make the mistake of publishing news which would be of assistance to the enemy, that this argument is without foundation. The Editor of the *Times* when he gave information to the *Times* in 1870 of MacMahon's march to relieve Bayonne, never thought he was betraying his country; the English papers the best of that is had in the help they were giving to Germany in the Franco-German war of 1870-1871 by publishing the reports of their correspondents, verbatim, the Editor of the *Times* had no idea it was possible that he could betray the valuable information he was giving to Russia the enemy of his country when on the morning of February 23rd, 1904 he published the information which I have just given.

At this point I shall take again to the *British Association*. Based *Association* to which I have already referred. Another argument which the *British Association* brings forward against censorship is

opinion. The writer suggests that the public have become so accustomed to having the news of the world at their breakfast tables that they would not permit any infringement on their rights in this direction. Moreover he goes on to say that the great newspapers have established a reputation for early and accurate news, which reputation they are bound to keep up in war. These last two arguments, *i.e.*, public opinion and the reputation of the journals, it would be difficult to treat seriously were they not written down in black and white in such a journal of note as the *Broad Arrow*.

The foundation on which they are fixed is evidently the idea, unfortunately very prevalent in England, that war is a kind of very risky game, which only concerns a small portion of the population, *i.e.*, the army, that this game can be watched with perfect safety (like a football match) by the remainder of the nation, that the duty of the nation stops short at providing the funds and raising a few volunteer corps, and that, in the meantime, the ordinary affairs of life, for the ordinary citizen, must go on as per usual. Our recent campaigns have, of course, strengthened this view. Our campaigns on the North-West Frontier of India, in Egypt, in South Africa, have all been fought far away from the Houses of Parliament. The citizens of London, unlike those of Paris, have never known what is to be besieged; have never known what martial law is like; have never waited, in the bitter winter mornings, rich and poor together, in long shivering queues for the dole of the day's bread. Our peasants have never known what it is like to have invading cavalry quartered in their villages, have never known what it is like to reap in order that they, while starving, may feed the enemies of their country. In other words, the people of England for the last two centuries have never known the horrors of war.

When we consider that in our next great war we shall be fighting, not for this or that piece of territory, not for a misunderstanding here or *entente cordial* there, not even, I venture to say, for the national honour, but for the national existence; when we consider that we shall be making far greater sacrifices, both as individuals and as a nation, for the success of our arms, than the mere doing without our *Morning Post*; when we consider that in all past campaigns neither patriotism nor reticence, nor discrimination has prevented the Press from giving information to the enemy; when the only arguments against censorship are vague platitudes as to the "freedom of the Press," "patriotism of the newspapers," "force of public opinion," "reputation of the great journals," and so forth; when we set against these sentimentalities the "majesty of facts," and consider that what our newspapers did in our last campaign, so will they do in the next! When we do this, we can come to but one conclusion that Press-censorship is absolutely necessary in war.

hunting wild beasts is of value to the soldier. Other attributes, such as those of methodical action and organisation, are called into play. For where an expedition has to be organised by the sportsman himself, as distinct from those "shows" which are arranged by rajas and other native or European potentates for their guests, it involves a considerable amount of forethought, and a great deal of arrangement and organisation. It is, in fact, a military campaign in miniature, with its strategical and tactical features. In the pursuit, for instance of tigers, the hunter is the general; his shikaris form the staff; the beaters are the army; and the finest animal in nature is the enemy.

The matters that have to be considered in the organisation and carrying to a successful issue of such an expedition may be conveniently stated as follows:—

- (1) Selection of theatre of operations.
- (2) Organisation of the expedition, including—
 - (a) Selection of shikaris, etc.,
 - (b) Supply,
 - (c) Transport.
- (3) Reconnaissance of the theatre of operations by advanced party.
- (4) Selection of camping grounds, and arrangement of camp, including—
 - (a) Water supply,
 - (b) Proximity to immediate scene of operations,
 - (c) Sanitation,
 - (d) Care of horses and cattle,
 - (e) Care of sick, and first aid and care of wounded.
- (5) Knowledge of the habits of wild beasts.
- (6) Arrangements for marking down the game, and for the drive.
- (7) Pursuit of wounded and dangerous enemy.

The range of country over which it is proposed to work, or conduct the campaign, has first to be selected. Information must be collected; maps have to be obtained and studied, and from intelligence as to the nature of the country, combined with a knowledge of the habits of wild animals, a likely area of ground may be chosen.

Thus, the experienced sportsman knows that the vicinity of water and the proximity of villages where cattle will furnish them with prey, added to extensive jungle where there are cool retreats, will be favourable for tigers. And that if bison, for instance, form the object of pursuit, it is better to seek the fastnesses of great forests, where no sounds save those of nature strike upon the ear, and where the wild animals can wander in peace over untrodden solitudes.

The intelligence branch having thus furnished information as to the theatre of operations, men with an aptitude for shikar, or at least possessed of natural attributes to fit them for the work, must be selected to accompany the expedition. The number to be taken depends on circumstances, but some half dozen mounted men will

be useful, as will appear hereafter. In Hyderabad suitable ponies for these men can be purchased for thirty or forty rupees apiece. Supplies both for men and animals have to be arranged for. These, except stores for one's self, can generally be purchased in some of the villages, but in years of scarcity it may be necessary to take everything from headquarters. Transport must be adapted to the nature of the country, that in local use being generally most suitable. Carts, and consequently roads, differ in different parts of the country. The inconvenience of using carts from another district will be realised when it is found that the deep ruts worn by local vehicles are not of suitable width, the length of the axles being different. It is as well to take a few camels or mules so that one need not be restricted to cart roads.

The next thing is to have the country reconnoitred, prior to the start of the expedition. A couple of intelligent men may be sent on ahead to engage local shikaris, if these have not already come in to head-quarters, and to enquire where tigers are to be found. One man should be able to write, and may be provided with a rough map of the country, and the names of the villages on the routes to be traversed. He will note down the information obtained, both as to game and supplies. A knowledge of character is essential to enable one to judge of the value of reports of different men—what to accept and what to reject. This one is prone to exaggerate, to see two tigers where there is only one, or to magnify a leopard into the greater feline.* That one is more careful, and by measuring the imprints of tigers' paws with pieces of dry grass, which he will bring back with him, proves whether the tracks in each locality are made by more animals than one. But he must be able to distinguish the impress of a fore-paw from that of a hind one. Reports must be sifted and appraised according to their merits, and the route chosen may depend upon these reports, as well as upon the nature of the season, whether exceptionally dry or otherwise. There may be water, and cover, and tigers one season, where there may be none the next, owing to the scanty rainfall that has preceded it. This preliminary reconnaissance may last a month, more or less, according to varying circumstances. It is of the first importance. The expedition is invariably limited by time, by the season if not by the period available to the sportsman.† Tigers must be sought for in the hot season of the year, when the heat and the distribution of the water limit their wanderings, and when the leaves have fallen and the jungle has thinned out sufficiently to expose them to view and fire when driven forth. Previous careful prospecting by skilful and experienced scouts will produce information as to the localities where tigers have taken up their abode, and may sometimes reveal exact knowledge as to their nightly round of prowling.

* I have known the excited imagination of a very intelligent native officer mistake a jungle cat for a panther.

† I write of this sport as carried out in Hyderabad, Deccan.

Thus, one locality cleared of game, the sportsman is not obliged to waste time in prospecting, but can march direct to the known haunts of other beasts, an advanced party to collect the latest information having probably been sent on two or three days ahead.

The first camping ground, at a place in the vicinity of game, will probably be 70 or 80 miles from head-quarters. Time may be saved, if horses are available, by sending the camp there direct a few days in advance, and posting horses so that one can ride to camp in a day. A map of the route and a compass will assist in enabling one to ride across country from village to village where the horses are posted. In this way I have ridden out 60 to 70 miles by midday, arriving in camp in time to shoot in the afternoon, or at least to look up some of the haunts of the tigers, and arrange for the next day's sport.

For the camp, small tents of the Cabul pattern should suffice; they do not weigh much, and lightness is requisite for the limitation of transport; they can be easily and rapidly pitched, and in the shade of the smallest trees and in places where there would not be sufficient space for larger tents. The camping arrangements should be inspected on arrival. The horses and other cattle must be picketed in shade and safety from predaceous beasts; I have more than once been disturbed by panthers and bears prowling near the camp. Questions of supply are enquired into, particularly with regard to water, that for drinking purposes being boiled and filtered. Useful expedients may be devised for adding to the comfort of the camp.

Presumably a party of shikaris has been sent on ahead with general instructions as to the locating of game, and with orders to tie out at favourable spots young buffaloes to serve as bait for tigers. The shikaris are interviewed, and information regarding the enemy—the tigers—is collated. Perhaps one of the buffaloes has been killed, in which case beaters will have been assembled and, if not far distant, there may be time to drive the tiger from his lair and shoot him. More often the shikaris have not done much. They require the presence of the chief to spur them into action.

As it is necessary for a general to know the character of the enemy, so should the hunter have studied the habits of the animals, recollecting, however, that each tiger may have its peculiar idiosyncracies. This one is addicted to lying in the water during the heat of the day; that one retreats up-hill when driven forth, instead of lingering in the shade of the ravine; one is a coward whom the herd boy will drive from his cattle with a stick and a shout; another is so fierce that men fear to approach him and will leave him in unmolested possession of his prey; one is given to wandering by daylight; another will never issue from his retreat until the hills cast cool shadows over the country; some prey on the beasts of the forests; others prefer domesticated animals, or even man himself.

All this has to be pondered over, but the habits of wild beasts can only be learnt by personal experience and intelligent observation. The character of the enemy and the nature of the country must be

known in order that the best method of circumventing him may be devised.*

Next morning after the arrival in camp, one may take five or six young buffaloes as bait for the tigers, and go out for the day, perhaps proceeding first with the shikaris and jungle men to the place where the presiding jungle deity resides on a cliff some five miles from camp, overlooking the valleys where the tigers love to roam. There a goat is sacrificed to the spirit of the Muhammadan saint, whose tomb gleams upon the heights. The ceremony at the *ziarat* concluded, the Hindu deity has also to be propitiated. This god dwells in the depths of the jungle, represented by a red-painted stone in a little hut with a ragged flag fluttering in the breeze, before which the old village *yogi*, smeared with wood ashes, mumbles fruitless orisons to his unresponsive deities. Another goat is slain, being first anointed with wine and made to bow down thrice to the graven image before its throat is cut. One of its feet is severed and hung up in the little hut which forms the sacred tenement. These heathen rites, though no more heathen than the exactly similar rites of Abraham of old, are important. Without them the shikaris will not hope for success.† They help to supply that moral element which is so essential to success both in sport and war.

On our way to and from these ceremonies we have not been idle. The jungle paths, the dry beds of the streams, the margins of the pools form the book of Nature in which we can plainly read of the comings and goings of the wild beasts. At one pool the great tiger reported to be here drank two days ago; the outlines of his pugs are not sharp and distinct as they would be in a recent impress, while on the neighbouring path his tracks have been almost obliterated by those of bears, deer, porcupines, and many other wild creatures that have passed by in the silent watches of the night. This is evidently a favourite haunt, for there are older marks of different dates, and he will doubtless return in the course of a day or two. Other tracks are found on the path at another place in the valley, evidently quite fresh; indeed, the tiger must have passed by after dawn, for his marks overlies those of the little quail which do not emerge until after break of day. High over the hill that falls

* I recollect one tigress that used each night to kill a buffalo tied up in the same place, where shade and water were plentiful, but she always made off to some distant haunt, the ground being too hard for tracking. Two drives having been carried out without success, on the third morning just after daybreak I took off my boots near the place, and stalked the tigress and shot her as she lay beside the kill near a pool of water.

† These people are very superstitious. At one place, where I killed a number of tigers, the shikaris ascribed our success to the beneficent influence of the Gonds and their Raja, to whom my superstitious followers attributed great power over the denizens of the jungles. The Gonds, if we had not propitiated them, would have warned the tigers against us, and would even have turned aside any bullets fired at them. Indeed, one that escaped my bullet was supposed by my shikaris to be under the special protection of the sylvan deity. For, said they, in all our wanderings in past years, how many tigers have we seen and slain? And of those seen, not one has hitherto escaped with its life? Surely there is a spell upon it. Therefore let us leave this beast which, the Gonds tell us, bears a charmed life,

sheer to the valley below, the vultures, mere specks circling in the azure sky, tell of the spot where lie the remains of the cow he killed two days ago. We may tie up one of our buffaloes here, and at intervals along the valley, where there is cover and water, arranging for the prospective beat at each place by deciding upon its direction, and the posts for the gun and stops. At another pool a clearly-defined pug shows plainly on the muddy margin—the track of a tigress, judging by its oval form, so different from the square mark of the male. She had stood for a moment on the path above before descending to the water, and after quenching her thirst had pushed her way through the grass, dank with the dews of night, where her course is plain, towards the hill above. Beyond the hill lies another ravine, with umbrageous nooks for the shade-loving tiger, and a running stream. No doubt she has gone there, as indeed her tracks prove. We might drive her out and shoot her now, but the day is far spent, and she will be on the alert. Better to hunt a tiger in the middle of the day, when it is heavy with beef and somnolent from the heat. Buffaloes tied up above and below the tracks will hem the tigress in with a ring of bait. Our buffaloes all used up, we can return to camp and await events.

Next morning one is up betimes, to visit first the most distant buffalo, for they should not be approached too early. After the bloody feast of the night the tiger frequently prowls round in the vicinity of the kill for some time in the cool of the early morning, and by going too soon one may disturb the animal and drive it to a distance. But the burning rays of the sun rising in the heavens force the beast, impatient of heat, to seek an umbrageous retreat near its prey, where it sleeps until the advance of night's phantom army, the shadows of the forest, shall herald a renewal of the feast. We are now nearing the place where the buffalo was picketed. The ground is carefully scrutinised for marks of the midnight murderer, but none are seen. The buffalo is viewed from a distance (the spot for this inspection has been chosen and tested as soon as the animal was tied up), a tree being climbed for the purpose, if need be. One must not approach too near. The tiger may be on the alert, if not still engaged on the bloody repast. The buffalo is lying on the ground, and appears very still, but a view through the binoculars reveals the flicking of an ear, and an occasional whisk of the tail to keep off the flies. The wretched beast is watered and washed in the pool; fresh grass is cut and placed before it, and it is again abandoned to its weary vigil.

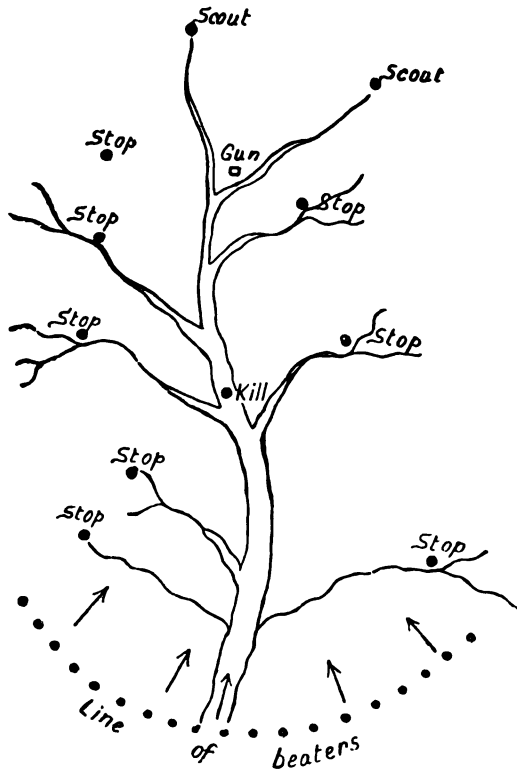
The second place is approached in like manner. A crow, perched on a tree above, caws loudly, looking the while with beady eyes at something below. It is a suspicious sign, accentuated by the appearance of a few dark specks circling far up in the sky overhead, and rendered almost a certainty by the fresh impress of a tiger's paws seen upon the dusty path. Over these tracks are footprints of porcupines and other nocturnal animals, indicating that the great beast has passed by early in the night. A view from a distance

shows that the buffalo has gone. Only a small quantity of the grass provided for it has been eaten. There is a broken piece of the rope with which it was tied, and that dark patch may be blood. The trail of a heavy body proves that the carcass has been dragged up a small channel on the opposite side of the watercourse. If all is well arranged, nothing can now avert the monster's fate.

We are now in contact with the enemy. Strategy is ended, so far as this particular animal is concerned, and tactics have begun. A man on horseback is at once sent back to camp, where mounted men are in readiness to go out and collect beaters from the surrounding hamlets, sometimes having to ride a distance of five or six miles. The nature of the ground determines the number of men required for the beat, which may amount from a dozen to a hundred or more. Meanwhile the other buffaloes that have been tied out are viewed in the same manner. If there be another kill, a second drive can be carried out. The beaters arrive in detachments, and we march off towards the scene of action. Within a mile or less of the kill a halt is called, and the army of beaters is split up into two divisions. In one—generally the smaller division—the more expert and intelligent men are placed, these being intended for posting as stops at the flanks of the beat, to turn the tiger should he attempt to break out. The remainder, armed with rattles, drums, and other noisy instruments, are marshalled by the shikaris and placed under charge of sepoys or other trusty men, one or two of whom should bear fire-arms to give the beaters some sense of security.* Careful directions are given to keep the beaters in an extended line, according to the nature of the ground, groups being necessary at times to beat thickets and dense jungle. Like soldiers in the attack, the beaters have a tendency to crowd together. The first division is now marched off with the sportsman and the head shikari. Skirting the jungle in which the tiger is supposed to be, the men are posted as stops in trees at intervals along the flank of the beat, overlooking nallahs and other likely places where the tiger might attempt to break out, and each man having instructions as to what he is to do. Generally a slight noise, such as the cracking of a dry stick or a cough, is sufficient to turn the animal; sometimes clapping of the hands, and even shouting are required to attain the desired object; and on one occasion when the tiger stood roaring at him, my orderly had to throw his shoes at it to turn it. Arrived at the apex of the triangle the base of which will be formed by the beaters, and the flanks by the stops, the sportsman takes up a place in a tree or other commanding position where he has a good field of view and fire, and the stops on the other flank are then posted by the head shikari who, this accomplished, rejoins the beaters. All is now ready. It may be assumed that, as a general rule, an animal should be driven out in the direction it would naturally take, any probability of an attempt

* Some consideration should be shown to those fearless men who, armed only with a stick or an axe, enter the jungle to drive the fiercest of wild beasts from its lair.

to break back through the beat or the stops being thus minimised. The beat has been arranged on this basis, the direction being indicated



by knowledge of the ground and of the habits of the tiger. The drive commences with a simultaneous uproar of the beaters. Now the sportsman must be on the alert; every sense must be strained, and no precautionary detail must be omitted. The moment for which all these preparations have been made is at hand. The barrels of the rifle and the cartridges must be examined, and the rifle cocked the moment one is in position. For the tiger may have been disturbed in the posting of the stops, and may appear sooner than expected.

All unnecessary movements or noise must be avoided. The clink of a ring on the barrels, or the glint of sunshine on a bright muzzle may suffice to turn the game. All these details, however insignificant they may appear, must be considered beforehand.*

* Many years ago I was watching over a pool of water, when a panther came down to drink. I had neglected to cock my rifle, and now omitted to do so silently. Hearing the click of the trigger, the panther sprang away into the bushes, and when it returned, it was too dark to make a successful shot. Needless to say, the error has never been repeated. Success in all things depends on attention to detail.

The beat approaches. The discordant noise of tom-tom and drum, the wild shouts of the beaters draw nearer. Is the beat empty? No! the sound of a heavy footfall strikes upon the listening ear, as of a great beast trampling amid the dry leaves that lie thick upon the ground. Now the heavy breathing can be heard. Be quiet, oh beating heart! and steady, oh trembling hand, or all your labour will have been in vain! The tiger emerges from a thicket, and stands for a moment, gleaming golden in the sunlight, and listening to the noise that pursues him. Then with a gruff roar, he dashes forward, taking exactly the line that has been foreseen.

The moment has arrived. A bead is drawn on the shoulder; the bullet speeds home; the tiger falls, but, roaring fiercely, raises himself on his haunches; he has received his death-wound, but fire again! for the enemy is dangerous so long as he lives and has the power to strike. Should he escape wounded for the time being, he must be followed up with great circumspection, or lives may be lost. But if attention is paid to every detail and no chance neglected, this dangerous operation may generally be carried out with success. The hunter follows on the blood-tracks, if such there be, alert, and with his rifle ready, applying his knowledge of jungle-craft, if there be no tracks, to determine the probable line of the tiger's retreat.

Scouts are placed in commanding positions on the flanks, and others, accompanying the pursuer, climb trees at intervals to look out ahead and point out the position or the movements of the stricken beast. His line of retreat should also be watched, if convenient, by posting men beyond the position he has taken up. No ground that can conceal the tiger must be left unseen, and it is wonderful in how small a depression the animal will hide. The great thing is to keep on the trail. To come in on a flank is dangerous.*

Should a man be wounded in the encounter, one must know how to treat the wounds, and carbolic acid and other remedies should be at hand.†

While these operations have been in progress, several parties, each with a mounted messenger, have been posted at villages eight or ten miles off, in the vicinity of which tigers are known to be. When a kill takes place, the mounted man rides post-haste into camp, leaving the other men on the spot to collect beaters. If there is time, two or three tigers may thus be shot in one day in widely different places. A day or two before the time arrives to move the camp to new ground, a party is sent on to make all the necessary arrangements, and we move rapidly the fifteen or twenty

* I once cut in on the line of retreat of a slightly-wounded tiger, and came suddenly upon it at the distance of a few feet, in a depression of the ground. Fortunately, the animal was lying down; and I was able to shoot it on the instant before it could charge.

† Although several men have been wounded when with me on such occasions, no lives have been lost.

hunting wild beasts is of value to the soldier. Other attributes such as those of methodical action and organisation, are exacted for play. For where an expedition has to be organised by the sportsman himself, as distinct from those "shows" which are arranged by rajas and other native or European potentates for their guests, it involves a considerable amount of forethought, and a great deal of arrangement and organisation. It is, in fact, a military campaign in miniature, with its strategical and tactical features. In the pursuit, for instance of tigers, the hunter is the general, his shikaris form the staff; the beaters are the army; and the finest animal in nature is the enemy.

The matters that have to be considered in the organisation and carrying to a successful issue of such an expedition may be conveniently stated as follows:—

- (1) Selection of theatre of operations.
- (2) Organisation of the expedition, including—
 - (a) Selection of shikaris, etc.,
 - (b) Supply,
 - (c) Transport.
- (3) Reconnaissance of the theatre of operations by selected party.
- (4) Selection of camping grounds, and arrangements for:—
 - (a) Water supply,
 - (b) Proximity to immediate scene of operations,
 - (c) Sanitation,
 - (d) Care of horses and cattle,
 - (e) Care of sick, and first aid and care of wounded.
- (5) Knowledge of the habits of wild beasts.
- (6) Arrangements for marking down the game, and for its drive.
- (7) Pursuit of wounded and dangerous enemy.

The range of country over which it is proposed to work, or to conduct the campaign, has first to be selected. Information must be collected; maps have to be obtained and studied, and from these gathered as to the nature of the country combined with a knowledge of the habits of wild animals, a likely area of ground may be chosen.

Thus the experienced sportsman knows that the vicinity of water and the proximity of villages where cattle will furnish them with prey, add led to extensive jungles where there are many retreats, will be favourable for tigers. And that if he is, for instance, forming the plan of pursuit it is better to seek the fastnesses of great forests where the sounds save those of nature strike upon the ear, and where the wild animals can war for in peace over unfenced territories.

The intelligent hunter, by using his fastidious sense to select the theatre of operations, men with an aptitude for shikaris, at least possessed of natural attributes to fit them for the work, must be selected to accompany the expedition. The number to be taken depends on circumstances. But some half-dozen mounted men

be useful, as will appear hereafter. In Hyderabad suitable ponies for these men can be purchased for thirty or forty rupees apiece. Supplies both for men and animals have to be arranged for. These, except stores for one's self, can generally be purchased in some of the villages, but in years of scarcity it may be necessary to take everything from headquarters. Transport must be adapted to the nature of the country, that in local use being generally most suitable. Carts, and consequently roads, differ in different parts of the country. The inconvenience of using carts from another district will be realised when it is found that the deep ruts worn by local vehicles are not of suitable width, the length of the axles being different. It is as well to take a few camels or mules so that one need not be restricted to cart roads.

The next thing is to have the country reconnoitred, prior to the start of the expedition. A couple of intelligent men may be sent on ahead to engage local shikaris, if these have not already come in to head-quarters, and to enquire where tigers are to be found. One man should be able to write, and may be provided with a rough map of the country, and the names of the villages on the routes to be traversed. He will note down the information obtained, both as to game and supplies. A knowledge of character is essential to enable one to judge of the value of reports of different men—what to accept and what to reject. This one is prone to exaggerate, to see two tigers where there is only one, or to magnify a leopard into the greater feline.* That one is more careful, and by measuring the imprints of tigers' paws with pieces of dry grass, which he will bring back with him, proves whether the tracks in each locality are made by more animals than one. But he must be able to distinguish the impress of a fore-paw from that of a hind one. Reports must be sifted and appraised according to their merits, and the route chosen may depend upon these reports, as well as upon the nature of the season, whether exceptionally dry or otherwise. There may be water, and cover, and tigers one season, where there may be none the next, owing to the scanty rainfall that has preceded it. This preliminary reconnaissance may last a month, more or less, according to varying circumstances. It is of the first importance. The expedition is invariably limited by time, by the season if not by the period available to the sportsman.† Tigers must be sought for in the hot season of the year, when the heat and the distribution of the water limit their wanderings, and when the leaves have fallen and the jungle has thinned out sufficiently to expose them to view and fire when driven forth. Previous careful prospecting by skilful and experienced scouts will produce information as to the localities where tigers have taken up their abode, and may sometimes reveal exact knowledge as to their nightly round of prowling.

* I have known the excited imagination of a very intelligent native officer mistake a jungle cat for a panther.

† I write of this sport as carried out in Hyderabad, Deccan.

miles, perhaps by night to escape the great heat of the day, or in the early morning to arrive in time to drive out any tigers that have been marked down.

In the intervals when tigers are wandering or have not yet been located, other game may be sought for and the camp thus kept supplied with meat. There are many lessons to be learnt from stalking wild animals and observation of their habits of adaptability to their surroundings. Down by the margin of the river the spotted deer may be found in large herds, browsing on the hanging branches, or drinking at the stream, where their graceful forms are reflected in the flood. Stalking is a pleasant pastime, and good training for scouting work. The eyes and ears have to be constantly on the alert to detect the flick of an ear or the whisk of a tail, sole indication of the presence of an animal standing motionless at the approach of danger, and provided by nature with a protective coloration which blends harmoniously with the environment. The feet have to move as though shod with velvet over fallen leaves that crackle under foot and dry sticks that break with a noise like the crack of a rifle. The shot has to be taken rapidly and with decision, to take advantage of the fleeting moment that offers itself before the wild animal has disappeared like a spectre in the shades of the forest.

For the scout all this is the image of war. Let him observe the stag or bison standing motionless in the jungle when danger is suspected, and he will learn to remain without movement in a situation where concealment is desired, and where the slightest motion would at once reveal him to an observant foe. No better example in the art of taking cover can be adduced than that of the feline stalking its prey, and taking advantage of every obstacle and inequality of the ground. A bush no larger than his head will conceal the creeping tiger or leopard from view. The observation of animals in retreat also teaches us some useful lessons in the art of taking cover.

Watch the alarmed gazelle bounding off across the undulating plain or over the low hills. The animal will stop at intervals to observe the movements of the pursuer, but it will generally stop behind a bush or other obstacle, that at least partially conceals it from view, or where it can see without being seen. So also in stalking his quarry the hunter adopts the tactics of wild animals, keeping behind cover, and remaining motionless when he is observed by the creature he is trying to approach; if possible he will keep the rising or setting sun at his back. In the observation of tracks the experienced sportsman will at once see many signs to tell him whether they are fresh or otherwise, and the habit acquired of being constantly on the alert, and using the powers of reasoning for the elucidation of signs,* cannot fail to be of use not only to the scout but to every soldier in time of war.

* By intelligent observation it is possible to reconstruct an entire scene from tracks and other signs. An example may be given. I once found the remains of a cow bison that had been killed and devoured by a tiger. The skin, skull, and hoofs

There are many other things to be learnt from Nature, of which, perhaps, the attribute known as an "eye for country" is the most valuable. A knowledge of the seasons when, and of the localities where useful natural products may be sought will be acquired, as well as some skill in the detection of places likely to hold water, and in the signs of the weather. An observation of the protective coloration of animals is also not without its uses.

But among the most useful acquirements of the hunter, and particularly of the officer of the Indian Army, is the knowledge gained of the country and people; and especially the intimate relations with those among his followers who are soldiers in his regiment. These latter are intimately associated with him in the pursuit of game. He learns their characters and appreciates their valuable qualities, which may be revealed not only in the daily work, but in their behaviour in situations of danger, where the native soldier never fails in his devotion to his officer. At night after the labours of the day are over, if the finest pursuit in the world can be called a labour, the hunter and his following meet in friendly conclave, and discuss the past day's events or the arrangements for the morrow, and the conversation drifts to many other and interesting subjects.

As for the devotion of the native soldier in time of danger, many incidents might be quoted. On one occasion an officer* was seized by a tiger, when his orderly rushed up and drove a spear through the beast, releasing his master too late to save his life. On another occasion an officer† pulled a panther off one of his men by the tail, and lost his life in consequence. My own orderly, seized and severely wounded by a tiger which then left him, called out to me to go on and shoot the beast, and not to trouble about him. The same man stood the charge of a tigress which scattered

lay there, and some of the bones. The horns had disappeared, having been gnawed off by porcupines or carried away by the jungle men. Near by lay the remains of a vulture which had too early endeavoured to play the part of scavenger in the feast, and had evidently been killed in the attempt. The signs in the surrounding jungle enabled me to reconstruct the whole scene of the tragedy, for the ground had been wet and somewhat marshy when it took place. There were the pugs of the tiger where he had crept towards his victim, while the disposition of the tracks indicated where he had made his final rush and had borne his prey to the ground by the very impetus of his onslaught. The bison was one of a herd of about eight animals, among them a fine bull whose hoof-marks were clearly outlined in the hardened mud. They had been browsing on the succulent shoots of the bamboos, many of which had been nipped from the parent tree. When the tiger's onslaught took place the herd had stampeded helter-skelter, evidently led by the bull, for his spoor was almost obliterated by that of the cows which followed him in the rush through the jungle. The tiger had feasted at the spot where the kill took place, for the carcass of his victim was too heavy to drag away. After eating his fill he had quenched his thirst at a neighbouring pool, where his paws had left deep impressions on the margin. He had then lain down to rest, watching the remains of his prey, among the grass and bushes close by, where the impress of his form could be distinguished, and had from thence rushed out to slay the intrusive vulture which, perhaps gorged with flesh, had not time to take wing and escape the mighty paw. All this could be read in the book of Nature which lay open before me.

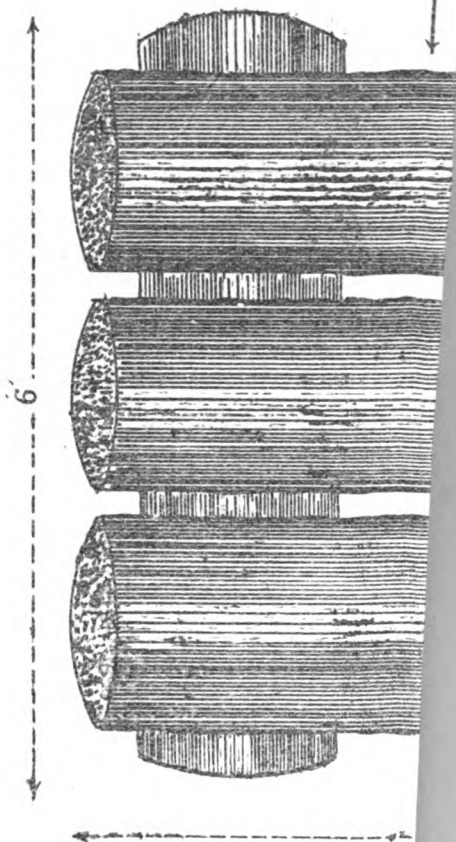
* Captain Whistler, 2nd Infantry Hyderabad Contingent.

† Lieut. A. L. Harries, 3rd Cavalry, Hyderabad Contingent.

the line of beaters, and shot it dead, thus in all probability saving several lives. Old Nathu shikari, now alas, gone to the Happy Hunting Grounds, who had once been a sepoy, had a habit of running up to a tiger or panther that had been shot and beating it with a stick, although the animal might still be struggling on the ground. The same brave spirit has stood beside me unflinchingly many a tight corner. Perhaps most gallant of all was the Sikh Sowar Gopal Singh of the 20th Deccan Horse, who, when the present writer was seized by a panther, rushed up and beat the beast over the head with the butt-end of the gun he was carrying. Such incidents as these, and the friendly intercourse of the chase, bring men together, and foster a mutual liking and respect, irrespective of colour, or race, or creed.

Fig. I

PLAN



RAFT OF RUSHES.

**Constructed by C. Company, 1st Battn., The King's Own Regiment,
at Shwebo, Upper Burma. August 1907.**

BY CAPTAIN H. K. CLOUGH, THE KING'S OWN REGT.

The raft consisted of five fascines approximately six feet long and two feet diameter.

Materials:—Bull rushes. Lashing Rope. Tools:—10 Dahs.

Number of men:—10.

Time:—About $3\frac{1}{2}$ hours.

The raft was constructed from bull rushes growing in a tank in the Cantonments Shwebo, Upper Burma; ten men were employed, and the time taken was about $3\frac{1}{2}$ hours spread over three days, August 26th, 27th and 28th. The rushes were full grown and green, and full of sap. They were cut by the men wading in the water and each fascine was constructed on the bank and then rolled into the water. On account of the great weight of each it would be impossible to make the raft on land and then launch it. One fascine carries 3 men with ease and safety. Two of the fascines lay in the water for 2 days and one for 3 days and lost practically none of their buoyancy. The difficulty in binding the fascines is the great objection when a long piece of rope is used, four short lengths at intervals tightened by means of a "choker" would be more effective. Binding with rushes twisted into ropes would be possible, but requires a certain amount of skill. When the five fascines were finished the raft was constructed as shown in Fig. I in the water and carried 13 men with ease and probably would have borne the weight of 20; no more men happened to be available at the time to further test it.

Two men navigated the raft with bamboo poles.

It would, perhaps, be better to have three fascines to support the raft instead of two as when fully loaded the centre "sags" somewhat.

There is no doubt that rushes and especially bull-rushes are most excellent material for rafts, and in a green state when full of sap or juice the rushes are at their best for buoyancy; when used dry and dead in all probability they would become water-logged in a short time.

The raft in question was the first ever built by the men employed, and without doubt, with a little practice, very much less time would be needed for the work.

THE STRATEGY OF THE WATERLOO CAMPAIGN.

A SPECULATION.

BY LIEUT.-COL. F. J. S. CLEEVE, R.F.A., P.S.C.

It is not necessary, for the purposes of this article, to recapitulate the actual dispositions of the forces in the theatre of war, nor to comment on the general strategical considerations involved in those dispositions. These will be found in Hamley and many other standard works.

The question that it is proposed to discuss is the very small part borne by Antwerp in the strategy of the campaign, with a speculation as to the reasons for the same.

It must be remembered that at the time of the outburst of Napoleon from Elba, the utmost political tension existed between the powers, and that the only bond of union was the fear of a further protracted succession of Napoleonic wars, involving great changes in the political geography of Europe, whilst Napoleon himself must have been hopeful of regaining his former power and predominance in the counsels of Europe.

It is thus reasonable to suppose that any power which might make a decisive strategical use and prolonged military occupation of Antwerp, probably involving fortification to the point of impregnability, would enjoy the nine points of the law comprised in possession (or at least recognition of an indefinitely postponed evacuation), in any geographical redistribution that might be involved in a treaty of peace,—temporary or otherwise,—that might result from the fluctuations of the struggle.

There would thus be the strongest political susceptibilities as to any action which might cause Antwerp to come into actual occupation by any of the allies, except in case of the strongest military necessity, whilst, as a strategic point, it was probably more coveted by Napoleon than any in Europe, and, at that period, may reasonably be regarded as the Constantinople of the Napoleonic question.

Provided that it should play no important military part in the campaign in Belgium, it was probable that, with the occupation of Brussels, it would fall, almost automatically, into the hands of Napoleon; but, if the allies should be forced to sink their jealousies and make it a prominent feature in the campaign, it might prove more than a Torres Vedras to capture.

However, at the commencement of the campaign, it was in the hands of the Anglo-Dutch, and, together with the route to Brussels, was sufficiently organised to bring it into working order as a base and line of communication, the principal British line of communication running through Ghent and Ostend.

Hamley remarks (p. 180, Operations of War).

"Had the allies been both of them based on Antwerp, they would, by forming front on any arc of which certain roads were the radii, have covered both Brussels and their base. As it was, their front extended from Oudenarde to Liege, that is, on an immense arc, and still covered their communications with their bases very imperfectly."

He qualifies this, however (on p. 199, Operations of War) by stating that "If, then, allied armies, operating from divergent bases, *can combine*, their operation will be more effective than if they had a common base."

As regards the joint use of Antwerp as a base, there would have been administrative as well as political difficulties, and although, as regards the general situation and uncertainty as to Napoleon's probable line of operation, it would have had its advantages, in the three specific cases to be considered, the matter is open to controversy.

1stly.—If Napoleon should operate against the British lines of communication with Ostend, Wellington could re-base himself entirely on Antwerp (an art in which he excelled), when the lines of communication of the allies would have been thoroughly satisfactory for a continuance of the struggle.

2ndly.—If Napoleon should operate against the Prussian lines of communication with Cologne, Blücher would similarly require to shift his base to Antwerp, Wellington would be obliged to acquiesce, and the jealousies of the powers would be silenced by force of circumstances, and again the lines of communication of the allies would be thoroughly satisfactory.

As regards such a change of base, it must be remembered that, before the days of railways and metalled roads, canals and waterways were immeasurably the best form of communications and were far more highly developed as such, than at the present day, and that the principal Prussian magazines were on the Rhine at Cologne, and on the Meuse at Namur, Liege, Maastricht, etc., whence there were admirable river and canal communications with Antwerp.

A strong feature in canal transport is, that reliefs of horses required for the tow-path, and of personnel for navigation, can be carried on the barge itself, and that the entire 24 hours of the day are available for work.

Further, there was sea-communication with Antwerp, and, as regards British supplies at that port, small arm and artillery ammunition, unlike the conditions of the present day, were practically of universal pattern throughout Europe, and all equipment far less specialised. Foodstuffs in any case are universal.

3rdly.—The course actually adopted by Napoleon, of interpassing between the allies, was the least likely to throw either of them on to Antwerp, and, as an attempt will be made to show, Napoleon's grand tactics were conducive to throwing the allies back on their own communications, and especially unconducive to calling Antwerp into play.

On the morning of 16th June it became evident that the concentration of the Anglo-Dutch was far less advanced than that of the Prussians, and that a more pronounced display of force against the former would have ensured their defeat. Further Napoleon's despatch to Ney (p. 186, Hamley's Operations of War) appears to indicate that Napoleon believed Wellington's troops to be principally to the west of the Brussels road, and that they could be pushed off the same. The effect of a defeat on the Dutch-Belgian portion of Wellington's command must also be considered. As regards strategical allusions in this despatch, it must be remembered that they did not concern the action required to be taken, and that the despatch, as happened in another instance, might have miscarried.

It is certainly true that Wellington could not have been prevented from concentrating further to his rear, but this also applies to the Prussians who, if they had not been forced to fight at Ligny might, in the event of Wellington being defeated, probably have fallen back voluntarily towards the Meuse.

The fact, however, that the concert of the Prussians with Wellington would thus have been destroyed by the interposition of an adequate force (p. 199, Hamley's Operations of War), and that their left flank would have been exposed to the operations of any detached force,—such as was employed under Grouchy,—might probably have caused them to shift their communications to the north-west, thus getting into touch with Antwerp, with a view to re-establishing concert with Wellington, and they would probably have been undisturbed in carrying this out.

Napoleon, however, by his movement on Fleurus, went out of his way to make the defeat of the Prussians his primary object, and by decisively defeating them and enveloping their *right flank*,—though the left offered decided strategic advantages,—adopted the surest means of forcing them back along their line of communications, and of preventing them from adopting a more northerly line of communication tending towards Antwerp. He appears to have believed that he had entirely achieved his object, and to have despatched Grouchy merely to follow up his success.

As regards Wellington, it was obvious that after Blucher's defeat at Ligny, he had no option, strategically, but to retire, and, owing to the weather, the road to Brussels (*via* Gemappes) was practically a causeway. His forces on that road numbered some 30,000 men, and there appears, at first sight, to be no reason why Napoleon should have followed him with more than an equal number, especially as it was evident that there were Anglo-Dutch forces at Nivelles Braine-Le-Comte and to the westward which Wellington would be anxious to draw in towards himself, and the movement of which, particularly along the Nivelles-Mt. St. Jean road, could undoubtedly be hindered and harassed.

Moreover, at the battle of Waterloo, an endeavour to envelop Wellington's right flank would certainly have tended to prevent

a probable concentration, at Waterloo, of the troops from Hal, and of such troops, from the westward, as had not yet been able to converge sufficiently on Wellington.

That Wellington expected such a movement, is shown by his despatches, and by his placing his reserves in rear of his right, and maintaining a strong force at Hal.

Why did not Napoleon avail himself of this apparent tactical and strategical advantage?

The answer appears to be that any movement against Wellington's right would have tended to press him off his communications with Ostend, and divert him on to his communications with Antwerp.

We thus find Napoleon endeavouring to push Wellington back on his communications with Ostend, and Wellington mainly solicitous in preserving that line of retreat in case it should be required.

To what circumstance may this concord of appreciation on the part of the opponents be attributed, *viz.*, Wellington's preference for the Ostend line of communications, and Napoleon's entire concurrence in such preference?

The answer appears to be that Wellington relied on the co-operation of the Prussians, and framed his plans accordingly, and that Napoleon was unaware of this factor in the situation, and framed his plans on the contrary view.

To what was this co-operation on the part of the Prussians attributable?

To the fact that Blucher, though severely defeated at Ligny, had refused to allow himself to be headed off from a retreat northwards, had abandoned his communications, and on the 18th June was actually marching westwards to Wellington's support, though his left rear was being pressed upon by the enemy at the time.

It is reasonable to speculate as to whether there can have been any circumstance to justify such apparent recklessness.

Any one who has studied the situation at Wavre on the ground, and tracked the footsteps of the Prussians therefrom to Waterloo, must be struck with the extraordinary boldness of the Prussian operations, and the extreme importance in abandoning their communications eastwards,—which in face of Grouchy's movements they were not likely to regain,—of securing a fresh base and communications to the northwards.

What if Antwerp, with its stores and already developed line of communications with Brussels, and presumably with Louvain, the Nassau Division having been billeted on the Brussels-Louvain road should be at their disposal?

In the event of Wellington being defeated at Waterloo, the exhaustion to the French consequent on the battle, a retreat by Blucher on Antwerp would appear quite practicable and less difficult than that on Wavre; after the battle of Ligny Thielmann's corps in fact retreated from Wavre on Louvain on 19th June when defeated by Grouchy, a significant circumstance.

Owing to the suddenness of the Prussian concentration at Ligny by forced marches, which had not been completed by the date of that battle, their reserve stores, etc., could not have been pushed far away from the waterways of the Meuse, etc., by which transfer to Antwerp could be effected.

Politically, Antwerp was a "grand prize."

It is not likely that on such a point there would have been any but secret negotiations, principally verbal and confined to the most limited number of persons, nor, considering that Wellington would be most reluctant to make such a concession,—equivalent almost to offering to a Russian army the use of Constantinople,—that any definite assurance would have been given until the defeat of the Prussians at Ligny constituted a grave military necessity. The extreme mistrust of Wellington who, from his Indian service, was credited with Oriental astuteness by the heads of the Prussian Headquarters Staff, seems to point to some definite delicate negotiation of a conditional character.

The oft-mooted point, whether Wellington personally visited Blücher after Quatre-Bras, may also thereby be explainable.

The specific request for two Prussian corps may have had reference to the capabilities of Antwerp and the line of communications therefrom for immediate supply, and indeed, until the issue of the impending battle at Waterloo had been decided, it was impossible for Wellington to know whether he could himself be independent of his communications with Antwerp, and supply his entire army from those with Ostend. As events happened, both parties would be equally interested in subsequent secrecy, but the absolute loyalty of Blücher to his allies and to the common cause, was in any case highly commendable.

On the above hypothesis it would appear natural that Wellington, if defeated at Waterloo, should desire to fall back on his communications with Ostend *viâ* Alost.

In view of the doubtful attitude of some of the Dutch-Belgian troops, and his own experiences of demoralisation after entering Badajoz, he might probably wish to avoid entering a densely populated foreign town like Brussels; indeed, the conduct of some of the Dutch-Belgian troops at Waterloo, seemed to indicate that he was too close to Brussels as it was.

In this case the advantage of a force at Hal, as a *point d'appui*, to protect his flank during retirement on Alost, is apparent; also the massing of his reserves in rear of his right flank at Waterloo.

If his sole object had been to bar the road to Brussels, along which Napoleon was advancing, and to retire, if compelled, on Brussels, and Antwerp, it seems probable that his dispositions at Waterloo would have been different, and that his reserves would have been placed farther to his left, also, that the force at Hal would have been called in. Assuming that Wellington had been defeated and had retired *viâ* Alost on Ghent, and that the Prussians had

fallen back on Antwerp, it would appear that the campaign might have been indefinitely prolonged.

Napoleon, it is true, would have entered Brussels, but the advance of the Russian and Austrian armies against the French frontier on the south-west would have required his especial attention and, probably, personal presence elsewhere.

It would have been difficult for his successor, for which post Ney appears to be indicated, to operate against either army, without exposing his flank to the other, *i.e.*, both the allied armies would have been acting *in combination* from divergent bases (p. 199, Hamley's Operations of War), and the situation of the allies for a continuance of the campaign would have been by no means unfavourable.

APPENDIX.

List of places specifically referred to in the above article. These may be found in any map of Belgium. Oudenarde, Liege, Ostend, Ghent, Antwerp, Cologne, Namur, Maastricht, Fleurus, Ligny, Quatre-Bras, Nivelles, Braine-Le-Comte, Waterloo, Louvain Wavre, Brussels, Alost, Hal, River Rhine, River Meuse.

THE POSITION OF MILITARY BALLOONING AT THE PRESENT DAY.

[Translated from Supplement 88 to the "Internationale
Revue über die gesamten Armeen und flotten," of July 1907.]

BY CAPTAIN C. J. B. HAY, P.S.C., Q. O. CORPS OF GUIDES.

Of the numerous methods of obtaining information none has of late gained so great an impetus as that of ballooning, and the extensive trials which are being undertaken in many and diverse countries and armies with both captive and free balloons bear witness to the great significance which is attributed to this means of observation for the conduct of war and battles.

The Franco-German war of 1870-1871 afforded the first instance of the employment of balloons, and immediately after this France, England, and ultimately Germany pioneered the science of navigating the air. As a result of the English device of being able to carry the gas necessary for filling the balloon ready in a compressed state in steel receptacles, the captive balloon has become an useful article of equipment for the field army as well as for fortresses. The previous extraordinarily complicated and lengthy process of filling a balloon, which used to take three hours, can now be accomplished in a quarter of an hour.

In Germany the waggon-park was then organised—a contrast to the unwieldy vehicles of the French—the vehicles answering to the ordinary demands of military waggons, so that they could follow the troops closely wherever they went with sufficient mobility, and the employment of the park in the van of the army would give rise to no anxiety.

At length Germany succeeded by the introduction of the kite-balloon (cylindrical in shape), in overcoming to such an extent, the disadvantage of the spherical balloon, namely, that observation from the car in consequence of the amount of motion even with a wind of such moderate strength as 6 to 7 *mètres* (20 to 23 feet) a second was impossible, that now it is possible to overcome a wind of double this strength, and thus the balloon can be made use of for from 50% to 80% more days in the year. At the same time the English system of taking the gas ready in receptacles was dropped on account of the great weight of the latter, and in its place two methods of generating the gas at the place where it was wanted to be used were instituted, of which the one by means of caustic soda with aluminium may be considered as the more advantageous. In the meantime kiteballoons have been introduced not only into all

large armies, but also into small ones, such as those of Belgium, Switzerland, the United States of America, and others, and the detachments of aeronauts detailed to manage them form a regular component part of the organisation of each army.

It seems astonishing that captive balloons in the Russo-Japanese war were a complete failure, where there were for the first time opportunities of establishing their practical value, military worth, usefulness, and as to whether they are a necessity or not. We learn from the small amount of reliable information which is at our disposal regarding this subject at the present time, that the Russians originally had only the mobile fortress balloon detachment with two companies at their disposal, which produced gas by means of the action of sulphuric acid on iron at the places where it was required. It took with it seventy-six vehicles, and made such slow progress on the bad roads, that it never arrived at its destination at the time when it was wanted. In consequence of this, and because there was a lack of materials, the battalion had to cease work comparatively early.

The first East-Siberian Battalion accomplished somewhat better results at first, its companies being divided up among the three armies and attached to the 10th, 5th, and 8th Army Corps. At any rate it is reported in the account of the Battle of Sandepu that here indeed the observation from the balloon had been most successful. The later events turned out less favourable for this battalion.

The Japanese tried various methods of ballooning, but appear to have attained no solid success with their curiously shaped monsters of 440 cubic *mètres* capacity. At any rate no results with the field army have been reported. Before Port Arthur they kept themselves as a general rule at a distance of 8,000 *mètres* (8,675 yards approximately) from the Russian guns, and therefore at such a distance that it was not possible to see much. Only the movements of the Russian ships in the harbour, visible from afar on the glistening surface of the water, could be observed by them.

But in spite of these insignificant performances in war of captive balloons, which are to be attributed in the first place to faulty training of *personnel* as well as to defective *matériel*, they will undoubtedly retain their great importance for a long time to come and be absolutely indispensable for commanders in modern war. That is to say, until it is found possible to institute motor-balloons and flying machines fully adaptable for use in war, which will also be able to accompany troops in the field over all kinds of country.

People are at present engaged in endeavouring to evolve these air-ships and machines, especially in the German Empire and in neighbouring France. In England, too, flying machines are being constructed and tested, as is instanced by their appearance not long ago at the Cordingley Exhibition in London.

There are at present three different types of the latest steerable balloons: the rigid, the flexible, and the partially flexible. Repre-

sentatives of these three kinds are the balloons of Count Zeppelin, of Major von Parseval, and of the Brothers Lebaudy, respectively.

The rigidly built balloon of aluminium, perhaps the balloon of the future, is, in consequence of its gigantic dimensions—it holds about 12,000 cubic *mètres* of gas, is 126 *mètres* (385 feet approximately) long, with a diameter of 12½ *mètres* (about 39 feet), and can take 9 people in its car—very difficult to control.

It has, however, the great advantage that it retains its shape under all circumstances, that all parts can be set in motion with safety and are theoretically in their proper places; since it cannot be carried about unfilled it requires special arrangements, both for filling it and for the ascent as well as for the descent and for salvage, and it cannot be employed for military purposes until it can always make sure of reaching its original point of ascent or a prepared “harbour of refuge.” Whether with the help of its vertical steering apparatus it will be able to remain at a certain height for any length of time has not yet been proved. It is to be hoped, however, that the tireless and self-sacrificing pioneer in this vast and important field of science and of practical consequence, Count Zeppelin, will master all the difficulties still remaining. The three giant balloons, which he has constructed up to date, have indeed each in succession made a step forward, so that we may hope that the deserving cavalry-general with his fourth creation, whose trials in the summer of this year the whole civilised world is awaiting with eager expectation, may make a really considerable step in advance towards the goal for which he is striving. Details regarding the new balloon, the wherewithal for constructing which has been partially raised by means of a lottery (by permission) in the German Empire, are still lacking, but it has transpired that all earlier methods are to be surpassed and that an electric searchlight is to form part of the new equipment. Further it is said that the Count in his trial trips with his new balloon will undertake attempts with “receiving apparatus” for wireless telegraphy, in order to be able to follow these up later with similar ones with “sending apparatus”. A success in this direction would be of far-reaching importance, for up to date no safe means has been discovered or proved reliable for enabling orders, questions, and other communications to be sent from headquarters to motor-balloons hovering high up and far away in the air. Just in the same way there is lacking still that sure connection by means of which from the dirigable balloon information might be communicated to headquarters which may be perhaps some hundreds of *kilomètres* in rear. Carrier pigeons which are used for this purpose at the present time, fail too often and can only be regarded as a “*pis aller*.”

The second type, the flexible balloon of Major von Parseval, the co-designer of the kite-balloon mentioned at the beginning of this article, is in every way the exact opposite of the Zeppelin balloon. Herr von Parseval set himself the task of constructing a motor-air ship, which, as a matter of principle, with the exception of the car

and of part of the machinery disposed therein, dispensed with all inflexible parts and all strengthening and stiffening by means of pieces of wood or metal. And in fact he succeeded, as one of our earliest military aeronauts, the Commander of the Prussian Balloon Battalion, Major Gross, announced, in building a balloon which, when folded up in its unfilled state together with its car and motor, can be carried in a single railway wagon or in two country wagons, can be filled at any place desired without specially great labour, and then and there launched into the air.

The value of a balloon of this kind is thus of course enormously enhanced in comparison with one like that of Count Zeppelin, which cannot be carried about unfilled, or one which for its ascent requires special workshops, a special building, and as regards time a period of several days.

Major von Parseval's balloon has an irregular shape, something like that of a cigar, and its elongated form rather resembles that of the kite-balloon. This comparatively small balloon of 3,000 cubic *mètres* capacity has a length of 48 *mètres* (about 53 yards) and a diameter of 8·57 *mètres* (9·3 yards approximately), but carries a very powerful Mercedes motor and a crew of four people.

A very important question, which interests the widest circles in the closest connection with this construction of Major von Parseval's, is now, whenever it turns out to be possible to construct such entirely flexible balloons on a larger scale, when their capacity for carrying and their radius of action would be increased and at the same time their utility for military purposes be significantly extended. The secret is principally contained in the fact that with increasing size it becomes more and more difficult to maintain the shape in a state of tension without any stiffening.

Perhaps though the Motor Balloon Company, which at the instigation of the Emperor has lately purchased the Parseval Balloon will, in conjunction with its constructors, master all difficulties which confront it and thereby evolve for us a new and valuable means of obtaining information, etc., in war. Trials for this end which of course in the meantime are being kept strictly secret, are taking place continuously from a building on the land allotted to the Military Aeronauts at Tegel.

It has often been deplored in the press that in sharp contrast to the progress of the French in the field of steerable balloons and to the active interest which the French army leaders take in these events, our leading military circles remain far too dilatory in regard to military aerial navigation, and that not long ago the state (French) took measures to an adequate degree with reference to this weighty question which concerns the defence of the country as well.

The reproaches in consequence of this hurled at the Prussian Ministry of War are, notwithstanding, far from just, for it has been proved that these very authorities have followed each stage and each new feature in the field of aeronautics with great attention and conscientiousness.

That for these aims not long ago only a somewhat exiguous sum of money was made available from imperial funds is partially attributable to the fact that we are not so wealthy, as are the French, to be in a position to throw about many millions of money on aims which may turn out to be fruitless, and partially to the fact that we more than our western neighbours have been in doubt, and are still so, as to which of the three types of motor-airships now under discussion give promise of the greatest expectations and of the most value for employment from a military point of view, and consequently to be supported the most strongly.

In the meanwhile also, a fact which is but little known to the general public, the Prussian Ministry of War has taken in hand a steerable balloon of home construction. It is on the principle of the type of the "Patrie" of the French Lebaudy system, of which detailed mention will be made further on. Major Gross considers this type at present to be the only one which can be considered to even a certain degree to be of real use in war. The defects from which this balloon suffers (in order to deal with this one first), consist principally in the fact that, although it is portable, it always requires several days to set it up. This at once as good as puts an end entirely to its utility for a real campaign, and essentially limits it to reconnaissance work in the service of fortresses.

The defects of the opposition French one should now be avoided in the model of the German Ministry of War, and improvements be introduced, which should guarantee its useful employment for all purposes in war. A detachment of 3 officers, 10 non-commissioned officers and 75 men have already been trained with this balloon, and are said to have been perfectly satisfied with the first methodical trials.

The steerable balloon of the Brothers Lebaudy and the Engineer Juillon is the representative of the third of the systems now in vogue, namely, the semi-flexible. It exists in the form of several greatly improved types. All these are made of the same material as the Parseval balloon, and have from underneath the appearance of an enormous shark with a sharp-pointed head (the fore part of the balloon), and a powerful caudal fin (the afterpart of the balloon.) This kind of caudal fin presents itself in the shape of a great semi-circular serrated sheet of strong sheet-iron, which is in a way fixed into the balloon, so that when in flight it assumes a horizontal position and invests it with a certain stability. Underneath the balloon is fixed a large oval bottom-board, to which the car, together with the motor and mechanism, is attached by means of about 50 steel wire cords: in the afterpart is a great rudder, which resembles a fin and hangs in a perpendicular position behind. The driving power of the machine, in the first publicly exhibited model, is achieved by means of a Mercedes motor of 40 horse-power, which permits of the rotation of a screw-blade 2.4 *mètres* (about 8 feet) long, at the rate of 1,200 revolutions per minute, by means of which a speed of 40 *kilometres* an hour is attained. Under the car is a

ventilator, so that the necessary air may be led into the "air-bag" continuously (this latter being fixed inside the balloon) and by means of which the loss of gas which goes on, and which is only 2 *per cent. per diem*, is compensated for, and the balloon is always kept filled. The capacity of this "Lebaudy" is 500 cubic *mètres*, its weight, in consequence of the size of the machine, amounts to 3,000 *kilogrammes*, to which may be added 500 *kilogrammes* more for ballast together with four people of normal weight. The car is 4·8 *mètres* (about 16 feet) long, and is constructed of sheet-steel and steel tubes; it is divided into three partitions, of which the foremost is given over to the "man at the wheel". This individual looks after the fly-wheel for the steering, manages the valve-cord, and keeps an eye on the steam-gauge. In the centre partition is the motor, and in the after one the mechanician. This first Lebaudy balloon, which was brought to the notice of the military authorities, achieved an undisputed success in its various trial trips at Toul, which extended into the middle of last year, so much so that the French army leaders, at whose disposal the balloon was gratuitously placed, determined on ordering several more balloons of the same type.

In these, however, various improvements were introduced on the basis of former experiences. As one of the principal of these is to be noted the fact that while the original balloon could formerly only be transported when filled in its first trials from Châlons to Toul, and in the same way when being sent back to Meudon, in the case of the balloon "Patrie," which the Ministry of War purchased in December, 1906, as the first of the newly ordered balloons, the platform, which is 25 *mètres* (82 feet) long, and 6 *mètres* (20 feet) broad, can be taken to pieces, so that it is quite simple to load it up on a wagon or on a railway truck. In other respects, too, the "Patrie" type possesses substantial advantages in comparison with its predecessor. Touching its size, for instance, as it measures from end to end 62 *mètres* (about 202 feet) as against 58 *mètres* (about 190 feet) of the first balloon, and has a diameter of 10·3 *mètres* (about 33 feet) as against 8·5 *mètres* (about 28 feet) of the older build. Corresponding to this the capacity of the balloon with 3,150 cubic *mètres* is substantially larger than the one on which it was modelled, and in the same way the motor, which can develop the equivalent of 70 horse-power. Further, too, the framework is constructed of steel-tubing, and the car too is somewhat larger since it can take 6 people in place of 4. As regards its speed also the balloon "Patrie" is distinctly superior to its prototype, although the latter in its last trial trip before the testing Commission accomplished a very respectable performance, in that it covered the distance between Nancy and Toul, amounting to 15 *kilomètres* (about 9½ miles) in half an hour. The "Patrie", before it was sold, did seven different trial trips; the last one on December 7th, 1906, in charge of men of the 5th Engineer Regiment, in which it had to cover the distance between Moisson and Military Balloon Park at Chalais-Meudon against the wind at a height of 200 *mètres* (650 feet) above the

ground. The wind had a strength of 14 *mètres* (46 feet) a second, but in spite of this the distance of 52 *kilomètres* (33 miles) was accomplished in 1 hour and 12 minutes. The balloon "*Patrie*" after this was put to a second and greater test to see what it was capable of performing, when it travelled from Meudon to its eventual place of *rendezvous* at Verdun.

Here is being constructed at present a building for the balloon 65 *mètres* (about 212 feet) long in a meadow on the road to Belleville. It is to be built so high that the entrance will not need to be sunk, as is the case at Toul, when during the first trials of the original balloon a riding school was utilised for the purpose, the floor of which had to be dug up.

Besides the balloon "*Patrie*" the military administration has no further steerable balloons for employment with troops in the field or available for use in fortresses. For, the first "*Lebaudy*" balloon, which the Government has just lately bought, and which bears the official designation of "*Lebaudy No 3*," in contravention of an earlier decision, is not to be taken into use with troops, but is to remain for some considerable time for purposes of instruction in the Military Balloon Park.

On the other hand, there are three more balloons of the "*Patrie*" type actually in course of construction, concerning which it has already been settled that No 2, which is to be ready this year, and which is to be called "*Republique*", will be sent to Toul; No. 3, which will be ready for delivery in 1908, and which is to be called "*Démocratie*", will go to Epinal; and No. 4, which is not due for delivery for a long time, will find a home at Belfort.

There is a rumour now being circulated to the effect that, as soon as the four great frontier fortresses are fully equipped with balloons, each of the six armies, which it is known that France will place in the field on the outbreak of war, is to have a steerable balloon.

As concerning the employment of these balloons, according to the latest reports about the trial trips of the "*Patrie*", it would appear that it is not intended to make use of the free-going balloons solely for purposes of reconnaissance or for the institution of photographic panoramas, or for any work of this nature, but in certain circumstances to employ them as weapons, in this way that bombs may be thrown down from them on to the troops fighting beneath.

If, in reply to this it is pointed out in various ways in the press that such a use of balloons as a means of fighting is not permissible in accordance with the terms of the first Peace Conference at the Hague, the rejoinder must be given that this postulation is at fault at the present day. For, at that Conference it was merely announced on July 29th, 1899, that the High-Contracting Powers agreed that "the throwing of shells and explosives from balloons or in any similar new ways is prohibited for a period of five years." This declaration was ratified by the various powers in the years 1900 and 1901,

but is to-day, since it was not renewed either in 1905 or in 1906, not in force, and will certainly with difficulty find an opportunity of being included in the decisions of the International Peace Conference of the present year.

And, indeed, this seems all the less probable, if one considers the interesting deliberations regarding these important points of controversy of the year 1899, and in nearer perspective the reasons on account of which at the time the agreement was arrived at with regard to the non-employment of explosives from balloons.

The prohibition was especially recommended by the Military Delegates of Russia and the Netherlands. Emphasis was laid on the fact that the method of warfare in question represented not only an insidious and inhuman proceeding, somewhat resembling the poisoning of wells and the like, but also technique in general had not made such great progress as to warrant the assumption that the shooting and wounding of non-combatants should be excluded. To this point of view, after all the delegates in the Sub-Commission, with the exception of the English, had spoken in favour of the above-mentioned prohibition, the Delegate of the United States of North America gave detailed expression, in that he emphasised the fact that in the position of technique at the time harmless individuals, churches, and hospitals could be destroyed just as well as the troops, harbours, and fortifications of the enemy. If, therefore, the prohibition of such a method of warfare must be deemed thoroughly necessary at present, the abovementioned reasons against it will soon become ineffectual in the rightly expected improvement in ballooning, for there is no bar in the future to posting balloons at any point desired at a critical moment, by means of which victory would be decided without violating the abovementioned conditions. By means of a dirigable war-balloon to be employed at pleasure no unintentional damage would, according to this, be caused; its effect would not be inhuman, but, on the contrary, like all methods of war of concentrated intensity, would rather localise and precipitate the destruction, and in consequence, considerably curtail the final decision of the war, which is a result only to be wished for in the interests of mankind. "Machinery must, therefore, not be set in motion to exclude for a long time such a means of fighting, which the future will probably bring forth, but it should suffice to put a stop to this method of carrying on war for a certain length of time, until it can be directed on the abovementioned orderly lines, and by this means exclude harmful circumstances which are not to be avoided in consequence of the position of technique at the time."

Inasmuch as the French have the sole right to assert and claim that in accordance with their experience the hypotheses on which the agreement here referred to was concluded in the year 1899, no longer hold good, and other powers also have arrived at totally different conclusions in the opinions they hold regarding the military utility of dirigible balloons, to those which they had in the year 1899, thus, as has been already said, it will be difficult this time

to obtain a majority at The Hague to ratify anew the former agreements regarding the use of shells and explosives from balloons

Although we are not in a position to prove that all statements are correct, it may here be interpolated as a matter of common interest that, in England particularly, the fear of the dirigible balloons of the French would appear to be very great, and the press is continually harping on the statement that Parliament ought to compel the Government to turn its attention more than it has done up to date to the development of military ballooning. In most impressive words Mr. Edge, not long ago, gave vent to his opinion on this important question in the columns of the "Daily Express", saying that the French were so amply equipped with balloons that with the aid of them the whole British Fleet might be rendered absolutely and entirely useless at a distance of 20 English miles from the French coast.

It is incomprehensible that the Government does nothing, since the cost of balloons for purposes of war is comparatively small and amount to little more than £50,000. France would now be in a position, on foggy days, for instance, to let her balloons get so close over all the British men-of-war, which ventured within a certain distance from the French coast, that it would be simple to drop explosives on to these vessels, and in this way the most costly battleships could be destroyed without any further trouble.

Thus we are afforded the opportunity of briefly touching on the certainly most weighty question, what aspect does the carrying and employment of explosive shells in war balloons assume in the position at the present day of motor-ballooning.

And in this it will appear (to anticipate this most important fact here at once), that the carrying into effect is nevertheless not altogether so simple a matter, and the fears of the English for the threatened destruction of their fleet, even if they really ought to exist, are at present at any rate not on the whole well founded. In an extraordinarily instructive article, which that experienced aeronaut of the Society for the Study of Motor-Ballooning, Captain A. D. von Krogh, has written, and published quite a short time ago in the "*Zeitschrift für das gesamte Schiess- und Sprengstoffwesen*", the subject amongst others discussed was that, as a balloon on account of risk to itself was not able to travel too near the earth, the hitting of comparatively small objects, such as armoured towers, ships, and the like, would be extremely difficult. Therefore we must rightly regard with some scepticism the newspaper reports to this effect and the communications from eye-witnesses, which spoke of the very successful trials against such targets on the part of the Lebaudy balloons from a height of 500 *mètres* (1,625 feet approximately), and over. Besides heights of less than 1,000 *mètres* (3,250 feet approximately) although up to the present we have been unable to collect any wholly reliable experiences regarding the bombardment of dirigible balloons, will be decidedly dangerous owing to exposure to Infantry and Artillery fire. On the explosion of such large charges,

too, strong pressure-waves would be generated, which would spread into the air above, and might have an extremely unpleasant effect, on a balloon travelling comparatively near the ground. And, also, in such an event the ensuing vacuum with its consequent rapid rushing together of the air would prove an enemy not to be despised.

In other respects, however, the conditions are favourable for the attack of extensive objectives, as, for instance, blockaded forts and particularly harbours and the larger inhabited places. Against such objects one could operate either by night or else choose a day in foggy weather, and thereby be protected from view, as one would travel above the clouds. It would be sufficiently accurate to fix one's position by the compass, in order to reach the desired spot, and the fact that one was really right over it would be guaranteed, if the motor was stopped from time to time, by the noise which rises up from large places to a fairly considerable height.

Also as regards the amount of explosive material to be carried in a balloon Herr von Krogh gives most interesting data. In this connection it was stated in the press that the new French motor balloons were not to be feared in this respect, as they had not enough space to take with them an adequate supply of shells and the like. According to the undoubtedly correct calculations, which Captain von Krogh has put forward, this supposition does not hold good. In Major von Parseval's balloon, which, as we have seen, has a capacity of 3,000 cubic *mètres*, taking the normal calculation of manœuvring ballast at 200 *kilogrammes*, a further weight of 200 *kilogrammes* of explosive materials can be carried. If the above ballast were somewhat lessened, the amount of explosives could be raised to a weight of from 250 to 300 *kilogrammes*. And now as the "Patrie," with its capacity of 3,150 cubic *mètres*, has a somewhat greater bulk than the Parseval balloon, it can be loaded at the very least to a weight equal to the latter, with which, provided the marksmanship be tolerably good, favourable results ought to be attained.

It is, moreover, characteristic of the great significance which the French ascribe to military ballooning that the competent authorities, in spite of the successes of the Lebaudy balloon, are energetically trying to support and promote all further undertakings and progress in this field of enterprise. Thus, the trials at St. Germain, held a short time ago, with the improved dirigible balloon, "La Ville de Paris", of M. Henry Deutsch de la Meurthe, took place in the presence of representatives of the Ministry of War.

This balloon has a total length of 62 *mètres* (202 feet approximately), a capacity of nearly 5,500 cubic *mètres*, and is driven by an Argus motor, which by a "turn-register" of 900 turns develops 70 horse-power. The screw, made by Renard, is propelled by means of a cog-wheel arrangement with a reduction of 5 : 1. The eight small balloons, which are fastened to the four sides of the large one, embody a new idea. The first ascent did not pass off altogether satisfactorily, for, after travelling for a quarter of an hour, the motor did not work

smoothly. M. Deutsch, however, hopes soon to be able to improve this small defect, and then again to undertake trials.

Especially interesting to the military authorities is the latest balloon problem of that well-known sportsman, de St. Chaffrey, who has a balloon named after himself in hand, and who wished to start the public preliminary trials in May of this year. The balloon is at the present time lodged in the balloon-hall, "La Ménagerie," belonging to the Balloon Battalion at Versailles, and according to the arrangement of the Minister of War is to be manned exclusively by men of the Military Balloon Park at Chalais-Meudon. This balloon is said to be very like the small dirigible balloons which Santos Dumont constructed some years ago, and which are shaped like a spindle, with a car made of bamboo, obtaining their motive-power by means of a motor of 25 horse-power.

At the present, however, the French Ministry of War is directing the closest attention to the trials of the well-known aeronaut, Santos Dumont, with the "dragon-fly" built by himself, which were commenced on October 25th, 1906, and again renewed since that date. M. Dumont, who has for some considerable time busied himself with great success in the construction of dirigible balloons, and amongst other things won the "Deutsch" prize for his flight round the Eiffel Tower, is of opinion that this problem has not sufficient practical value, and that his flying-machine appertains to the future.

The invention of the "dragon-fly" is really to be traced to Austria, but work on it was not prosecuted in that country, and therefore in the year 1904 it was taken up by the young Brazilian, Dumont.

The "Bird of Prey", as this first flying-machine of Dumont was called, consists entirely of supporting sails, which are made of linen, with a rudder, an Antoinette motor of 50 horse-power with a weight including the entire mechanism of only 80 *kilogrammes*, and it can moreover run on a pair of wheels. Unmanned it weighs 160 *kilogrammes*, and has a length of 10 *mètres* (about 33 feet); the span of the wings amounts to 12 *mètres* (about 39 feet), while the sail-surface is 80 square yards.

M. Dumont's primary object was to earn for himself the prize of 500,000 francs (£20,000), offered a short time previously by Henry Deutsch and Archdeacon. This competition imposed, as is known, a flight of 1,000 *mètres* (about 1,075 yards) with aeroplanes. The conditions of it were, in the first place, that the flight must be continuous and unbroken, and, secondly, that the machine must return to earth to the same spot from which it started. At the first trial with the Dumont flying-machine it raised itself 3 or 4 *mètres* (10 to 13 feet) from the level of the ground, and flew for a distance of 80 *mètres* (87 yards). Then a screw failed, so that the flight could not be continued. The second trial passed off without any mishap, and in it the flying-machine covered a distance of 220 *mètres* (240 yards) at a height of about 5 *mètres* (16½ feet) above the ground-

level in $21\frac{1}{2}$ seconds. The greatest speed attained was 82·6 *mètres* in $7\frac{1}{5}$ seconds, that is, 42 *kilometres* ($26\frac{1}{4}$ miles an hour).

In the course of last winter Dumont built another "dragon-fly", to which he gave the name of "Bird of Prey 2nd", in the hope that with it he might attain his object more quickly. All that is known about its construction is that the supporting sails are made of wood and that the motor develops 100 horse-power. The trials undertaken with this machine in March and April of this year from the "Balloon Hall" near the parade ground of St. Cyr, in the presence of numerous officers and of the donors of the prize were, however, unsuccessful, so much so that Dumont has again taken up his first flying-machine, the "Bird of Prey".

But ill-luck overtook this one too in the trial undertaken once again a short time ago. After going a distance of 30 *mètres* ($32\frac{1}{2}$ yards) against the wind, the flying-machine rose easily to a height of $1\frac{1}{2}$ *mètres* (5 feet), but it was soon evident after a short trip that its stability left much to be desired. As soon as it had traversed a distance of 50 to 60 *mètres* (55 to 65 yards) in the air, it suddenly made a half-turn, and inclined so much towards the earth that one wing struck the ground. The consequence was that the machine grounded with a sharp shock, and Santos Dumont was buried underneath the broken parts of the wings. As the damages only affected the supporting sails and one of the wheels, and moreover both motor and air-screw remained intact, Dumont hoped within a short time to be able to repair the machine, and then subsequently to renew his trials.

This has certainly not come to pass up to the present. But in the French professional press one reads that the task which Dumont has set himself, as indeed his experiences up to date have sufficiently shown him, is one impossible of accomplishment, for, for many reasons he will never succeed in turning round in a wind back to the starting-place.

In the place of Dumont's machines, an aeroplane of Delegrange, which is a two-decker after the Dumont system, is being talked of a great deal at the present time in France. The first ordinary trials on the parade ground of Vincennes are now being followed up by others on the parade ground of Longchamps, in the course of which 67 *mètres* (73 yards) have been traversed in a flight.

The flying-machine of the American Brothers Wright, about which so much has been written of late, especially in the foreign press, we have intentionally left out of consideration, as the technical accounts of it vary so greatly. We have, as a matter of course regarded as improbable the report that the German Empire has bought the American invention, a fact which the entire press has announced. This news has just been denied from America, with the corollary that this flying-machine has been acquired by the Government of the United States at a cost of over 500,000 marks (£25,000), but the inventors are pledged to further secrecy of the plans, so long as it is being worked towards completion for practical use.

In connection with all these weighty experiences in the field of modern aeronautics, the pointing seems relevant to the conclusion that, the more general becomes the intention to make use of this method in military aims for finding out the measures, etc., which the enemy is taking, so much the more must a study be made of preventive measures with which the disadvantages to the army of these annoying "points of vantage" can be countered.

As has already been the case for some years in Germany and France, trials have now taken place in Austria at the School of Gunnery for Fortress Artillery in shooting at captive balloons with so-called "balloon-batteries" from 12 *centimetre* guns on wheeled gun-carriages. The results attained by these batteries in some 12 trials are said to have been that in 10 cases, after a period of 10 minutes at the most, the greatest number of shots being 40, the balloon was on each occasion brought to the ground.

Germany has gone a step further, for there people have been wrestling with the question of the effective fighting of dirigible balloons. It was first of all a question of a 5-*centimetre* armoured automobile gun detailed for this purpose : this was on view at last year's automobile exhibition in Berlin. Against this gun the objection chiefly raised was that its efficacy was not sufficient, for it was lacking in adequate range and hitting capacity, and above all had not a good shrapnel. An article which made its appearance in the *Militär Wochenblatt* demanded an effective gun, which brings up both its crew and ammunition by means of unarmoured, quick-moving, and strong wagons, which would have to serve as limbers or platforms, to a suitable place from which to shell the balloon, and would there remain under cover.

A field gun of this pattern is in course of construction at Krupp's works and this indeed in the form of a 6·5-*centimetre* gun L/35 on a recoiling carriage, in which the trunnions, as is the case with the later types of howitzers and mountain guns, are placed in rear, and which permits of an elevation to the barrel of 60°. The weight of the projectile is 4·3-*kilogrammes* (that of the cartridge being about 5·9 *kilogrammes*), and the muzzle velocity, if one demands on the one hand that the weight of the gun should not exceed 950 *kilogrammes*, and on the other that an absolute stop at less than 10° elevation does not appear requisite, would amount to about 600 *mètres* (1,950 feet) a second. To enhance the rate of fire a semi-automatic lock is made use of.

In view of the great importance, which the subject here alluded to has both for the science of modern shooting as well for aeronautics, its further development, especially with regard to the later results of shooting especially with the proposed 6·5-*centimètre* gun may be awaited with close attention.

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The exact position of the enemy, and particularly of his artillery, must be determined by officers' patrols, or other means, with the greatest care. Thus before the Yalu the Japanese sent out Chinese and Korean spies, and organised an active service of patrols along the river. A telescope was installed in a temple on an elevation on the bank. In the result when the battle began the Japanese authorities were informed in full detail of the extent of the enemy's position, his works and the position of his reserves. It is true that the negligence and apathy of the Russians gave the Japanese considerable advantage in obtaining the information.

But the reconnaissance of the enemy's position alone is not sufficient. The ground over which the attack will pass, the communications, the artillery positions, etc., must be minutely examined. If necessary the enemy's advanced posts must be driven in.

The plan of attack is the next operation. The chief commander divides up the ground, apportions the troops and informs each commander of a section of ground of the object in view. These latter then carry out their own reconnaissances.

The favourite Japanese plan, and one well understood throughout the army, was a combination of a frontal attack and an enveloping movement on a flank. The following is an example of a reconnaissance and subsequent attack.

During the battle of the Sha-ho, the II Japanese Army formed the left wing of the line. The 3rd Division was along the railway, the 6th on the Sha-ho, and the 4th between the Sha-ho and the Hine-ho.

On the 11th October the advanced Russian troops fell back in the line Shilihe-Enteniulu-Tontai, which had been strongly fortified. A regiment of the 3rd (Japanese) Division seized Enteniulu during the night of the 12th October, but was unable to hold it. Two more regiments attacked Tontai. At the same time the reserve (two regiments) was in the deep bed of the Sha-ho. The commander of the leading regiment sent out an officer's patrol along the bed

but is to-day, since it was not renewed either in 1895 or in 1900, not in force, and will certainly with difficulty find an opportunity of being included in the decisions of the International Peace Conference of the present year.

And, indeed, this seems all the less probable, if one considers the interesting deliberations regarding these important points of controversy of the year 1899, and in nearer perspective the reasons on account of which at the time the agreement was arrived at with regard to the non-employment of explosives from balloons.

The prohibition was especially recommended by the Military Delegates of Russia and the Netherlands. Emphasis was laid on the fact that the method of warfare in question represented nothing but an insidious and inhuman proceeding, somewhat resembling the poisoning of wells and the like, but also technique in general had not made such great progress as to warrant the assumption that the shooting and wounding of non-combatants should be excused. At this point of view, after all the delegates in the Sub-Committee, with the exception of the English, had spoken in favour of the above-mentioned prohibition, the Delegate of the United States of North America gave detailed expression in that he emphasised that, at the present position of technique at the time harnessing of the air, churches and hospitals could be destroyed just as well as the towns, harbours, and fortifications of the enemy. If therefore the prohibition of such a method of warfare must be deemed therefore necessary at present, the above-mentioned reasons against it will soon become ineffectual in the rightly expected improvement in technique, for there is no bar in the future to posting balloons at any point desired at a critical moment, by means of which victory will be decided without violating the above-mentioned prohibition. The means of a dirigible war balloon to be employed at present, if unintentional damage would, according to this, be caused, is not, would not be inhuman but on the contrary, like all other methods of concentrated intensity, would rather increase and prosper the destruction and in consequence, considerably curtail the interests of the war, which is a result only to be wished for in the interests of mankind. Machinery must therefore not be so motion to exclude for a long time such a means of fighting, which the future will probably bring forth, but it should suggest the first step to this method of carrying on war for a certain length of time until it can be directed on the above-mentioned other means, which this means exclude in certain circumstances, which are not to be avoided in consequence of the position of technique at the present.

However, as the French have the same right to assert a claim that in accordance with their experience the hypothesis, with which the agreement here referred to was concluded, is not valid, 1899 no longer held good and other powers also have the right to take advantage of their own claims in the opinion that a dirigible balloon is not a means of fighting, but a means of war, which in the year 1899 there is, as has been already said, it will be difficult to

to obtain a majority at The Hague to ratify anew the former agreements regarding the use of shells and explosives from balloons.

Although we are not in a position to prove that all statements are correct, it may here be interpolated as a matter of common interest that, in England particularly, the fear of the dirigible balloons of the French would appear to be very great, and the press is continually harping on the statement that Parliament ought to compel the Government to turn its attention more than it has done up to date to the development of military ballooning. In most impressive words Mr. Edge, not long ago, gave vent to his opinion on this important question in the columns of the "Daily Express", saying that the French were so amply equipped with balloons that with the aid of them the whole British Fleet might be rendered absolutely and entirely useless at a distance of 20 English miles from the French coast.

It is incomprehensible that the Government does nothing, since the cost of balloons for purposes of war is comparatively small and amount to little more than £50,000. France would now be in a position, on foggy days, for instance, to let her balloons get so close over all the British men-of-war, which ventured within a certain distance from the French coast, that it would be simple to drop explosives on to these vessels, and in this way the most costly battleships could be destroyed without any further trouble.

Thus we are afforded the opportunity of briefly touching on the certainly most weighty question, what aspect does the carrying and employment of explosive shells in war balloons assume in the position at the present day of motor-ballooning.

And in this it will appear (to anticipate this most important fact here at once), that the carrying into effect is nevertheless not altogether so simple a matter, and the fears of the English for the threatened destruction of their fleet, even if they really ought to exist, are at present at any rate not on the whole well founded. In an extraordinarily instructive article, which that experienced aeronaut of the Society for the Study of Motor-Ballooning, Captain A. D. von Krogh, has written, and published quite a short time ago in the "*Zeitschrift für das gesamte Schiess- und Sprengstoffwesen*", the subject amongst others discussed was that, as a balloon on account of risk to itself was not able to travel too near the earth, the hitting of comparatively small objects, such as armoured towers, ships, and the like, would be extremely difficult. Therefore we must rightly regard with some scepticism the newspaper reports to this effect and the communications from eye-witnesses, which spoke of the very successful trials against such targets on the part of the Lebaudy balloons from a height of 500 *mètres* (1,625 feet approximately), and over. Besides heights of less than 1,000 *mètres* (3,250 feet approximately) although up to the present we have been unable to collect any wholly reliable experiences regarding the bombardment of dirigible balloons, will be decidedly dangerous owing to exposure to Infantry and Artillery fire. On the explosion of such large charges,

too, strong pressure-waves would be generated, which would stream out into the air above, and might have an extremely unpleasant effect on a balloon travelling comparatively near the ground. And, as such, such an event the ensuing vacuum with its consequent rapid rushing together of the air would prove an enemy not to be despised.

In other respects, however, the conditions are favourable for the attack of extensive objectives, as, for instance, blockaded fortresses, particularly harbours and the larger inhabited places. Against such objects one could operate either by night or else, choose a day of foggy weather, and thereby be protected from view, as one would travel above the clouds. It would be sufficiently accurate to fix one's position by the compass, in order to reach the desired spot, and the fact that one was really right over it would be guaranteed, if the motor was stopped from time to time, by the noise which rises up from large places to a fairly considerable height.

Also as regards the amount of explosive material to be carried by a balloon, Herr von Kriegh gives most interesting data. In this connection it was stated in the press that the new French balloons were not to be feared in this respect as they had not enough space to take with them an adequate supply of shells and the like. According to the undoubtedly correct calculations which Captain von Kriegh has put forward, this supposition does not hold good. In Major von Parseval's balloon, which, as we have seen, has a capacity of 3000 cubic *meters*, taking the normal capacity of a manœuvring heliast at 200 *kilopoundmes*, a further weight of 250 *kilopoundmes* of explosive materials can be carried. If this heliast were somewhat lessened, the amount of explosives could be raised to a weight of from 250 to 300 *kilopoundmes*. And, as with the Patrie, with its capacity of 3150 cubic *meters*, has a somewhat greater bulk than the Parseval balloon, it can be loaded with, very least to a weight equal to the latter, with which, provided the marksmanship be tolerably good, favourable results ought to be attained.

It is, moreover, characteristic of the great significance which the French ascribe to military ballooning that the competent authorities, in spite of the successes of the Zeppelin balloons, are still busily trying to support and promote an further and further progress in this field of enterprise. Thus the trials at St. Germain held a short time ago with the improved dirigible, built by the Aero Club Français, of M. Henry Deutsch de la Meurthe, took place in the presence of representatives of the Ministry of War.

This dirigible has a total length of 62 *meters* or 202 feet, and a maximum capacity of nearly 5000 cubic *meters*, and is driven by a 40 *hp* engine, for which by a turning system of 900 *lb* can be developed 5 *hp* power. The screw made by Renault's works, and by means of which the arrangement with a revolution of 540 is effected, is 12 *ft* 6 *in* long, and is fastened to the turntable of the engine by means of a new device. The first ascent did not pass off altogether satisfactorily, for, after travelling for a quarter of an hour, the motor did not work

smoothly. M. Deutsch, however, hopes soon to be able to improve this small defect, and then again to undertake trials.

Especially interesting to the military authorities is the latest balloon problem of that well-known sportsman, de St. Chaffrey, who has a balloon named after himself in hand, and who wished to start the public preliminary trials in May of this year. The balloon is at the present time lodged in the balloon-hall, "La Ménagerie," belonging to the Balloon Battalion at Versailles, and according to the arrangement of the Minister of War is to be manned exclusively by men of the Military Balloon Park at Chalais-Meudon. This balloon is said to be very like the small dirigible balloons which Santos Dumont constructed some years ago, and which are shaped like a spindle, with a car made of bamboo, obtaining their motive-power by means of a motor of 25 horse-power.

At the present, however, the French Ministry of War is directing the closest attention to the trials of the well-known aeronaut, Santos Dumont, with the "dragon-fly" built by himself, which were commenced on October 25th, 1906, and again renewed since that date. M. Dumont, who has for some considerable time busied himself with great success in the construction of dirigible balloons, and amongst other things won the "Deutsch" prize for his flight round the Eiffel Tower, is of opinion that this problem has not sufficient practical value, and that his flying-machine appertains to the future.

The invention of the "dragon-fly" is really to be traced to Austria, but work on it was not prosecuted in that country, and therefore in the year 1904 it was taken up by the young Brazilian, Dumont.

The "Bird of Prey", as this first flying-machine of Dumont was called, consists entirely of supporting sails, which are made of linen, with a rudder, an Antoinette motor of 50 horse-power with a weight including the entire mechanism of only 80 *kilogrammes*, and it can moreover run on a pair of wheels. Unmanned it weighs 160 *kilogrammes*, and has a length of 10 *mètres* (about 33 feet); the span of the wings amounts to 12 *mètres* (about 39 feet), while the sail-surface is 80 square yards.

M. Dumont's primary object was to earn for himself the prize of 500,000 francs (£20,000), offered a short time previously by Henry Deutsch and Archdeacon. This competition imposed, as is known, a flight of 1,000 *mètres* (about 1,075 yards) with aeroplanes. The conditions of it were, in the first place, that the flight must be continuous and unbroken, and, secondly, that the machine must return to earth to the same spot from which it started. At the first trial with the Dumont flying-machine it raised itself 3 or 4 *mètres* (10 to 13 feet) from the level of the ground, and flew for a distance of 80 *mètres* (87 yards). Then a screw failed, so that the flight could not be continued. The second trial passed off without any mishap, and in it the flying-machine covered a distance of 220 *mètres* (240 yards) at a height of about 5 *mètres* (16½ feet) above the ground.

level in $21\frac{1}{2}$ seconds. The greatest speed attained was 82.6 metres in $7\frac{1}{2}$ seconds, that is, 42 kilometres ($26\frac{1}{4}$ miles) an hour.

In the course of last winter Dumont built another "dragée," to which he gave the name of "Bird of Prey 2nd," in the hope that with it he might attain his object more quickly. All that is known about its construction is that the supporting sails are made of wood and that the motor develops 100 horse-power. The trials were taken with this machine in March and April of this year from the "Balloon Hall" near the parade-ground of St. Cyr in the presence of numerous officers and of the donors of the prize were however unsuccessful, so much so that Dumont has again taken up his flying-machine, the "Bird of Prey."

But ill luck overtook this one too in the trial undertaken only again a short time ago. After going a distance of 30 metres (32 yards) against the wind, the flying machine rose easily to a height of $11\frac{1}{2}\text{ metres}$ (5 feet), but it was soon evident after a short trip that its stability left much to be desired. As soon as it had traversed a distance of 50 to 60 *metres* (55 to 65 yards) in the air it was made a half turn, and inclined so much towards the earth that its wing struck the ground. The consequence was that the machine grounded with a sharp shock, and Santos Dumont was buried beneath the broken parts of the wings. As the damages only affected the supporting sails and one of the wheels, and moreover both the engine and air screw remained intact, Dumont hoped within a short time to be able to repair the machine, and then subsequently to resume his trials.

This has certainly not come to pass up to the present. Even the French professional press one reads that the task which Dumont has set himself as indeed his experiences up to date have so far shown him, is one impossible of accomplishment, for, for many reasons, he will never succeed in turning round in a wind back to the starting place.

In the place of Dumont's machines, an aeroplane of 1800 grammes, which is a two-decker after the Dumont system is being taken to a great deal at the present time in France. The first ordinary trials on the parade-ground of Vincennes are now being followed by others on the parade-ground of Longchamp, in the course of which 67 metres (74 yards) have been traversed in a flight.

The flying machine of the American Brothers Wright, of which so much has been written of late, especially in the foreign press, we have intentionally left out of consideration as the true accounts of it vary so greatly. We have, as a matter of course, regarded as important the report that the German Emperor has bought the American invention, a fact which the entire press has announced. This news has just been denied from America with the contrary that the flying machine has been acquired by the Government of the United States at a cost of over 500,000 marks (\$225,000), but the inventors are pledged to further secrecy of the particulars, as it is being worked towards completion for practical uses.

In connection with all these weighty experiences in the field of modern aeronautics, the pointing seems relevant to the conclusion that, the more general becomes the intention to make use of this method in military aims for finding out the measures, etc., which the enemy is taking, so much the more must a study be made of preventive measures with which the disadvantages to the army of these annoying "points of vantage" can be countered.

As has already been the case for some years in Germany and France, trials have now taken place in Austria at the School of Gunnery for Fortress Artillery in shooting at captive balloons with so-called "balloon-batteries" from 12 *centimetre* guns on wheeled gun-carriages. The results attained by these batteries in some 12 trials are said to have been that in 10 cases, after a period of 10 minutes at the most, the greatest number of shots being 40, the balloon was on each occasion brought to the ground.

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But the reconnaissance of the enemy's position alone is not sufficient. The ground over which the attack will pass, the communications, the artillery positions, etc., must be minutely examined. If necessary the enemy's advanced posts must be driven in.

The plan of attack is the next operation. The chief commander divides up the ground, apportions the troops and informs each commander of a section of ground of the object in view. These latter then carry out their own reconnaissances.

The favourite Japanese plan, and one well understood throughout the army, was a combination of a frontal attack and an enveloping movement on a flank. The following is an example of a reconnaissance and subsequent attack.

During the battle of the Sha-ho, the II Japanese Army formed the left wing of the line. The 3rd Division was along the railway, the 6th on the Sha-ho, and the 4th between the Sha-ho and the Hine-ho.

On the 11th October the advanced Russian troops fell back in the line Shilihe-Enteniulu-Tontai, which had been strongly fortified. A regiment of the 3rd (Japanese) Division seized Enteniulu during the night of the 12th October, but was unable to hold it. Two more regiments attacked Tontai. At the same time the reserve (two regiments) was in the deep bed of the Sha-ho. The commander of the leading regiment sent out an officer's patrol along the bed

of the river. This patrol reported that the bed was not occupied by the enemy. The commander at once decided to advance along the bed. This was done under great difficulties, and very slowly, the reconnaissance officer acting as guide. Eventually the regiment found itself within 50 paces of the Russian trenches, and directly in their rear. A sudden fire by the Japanese drove the Russians into the village with great loss.

In the result as soon as the Japanese frontal attack began, the Russians evacuated Tontai, thus compelling the abandonment of Enteniulu. The Russian front was enveloped.

The Japanese flank attack had thus ensured the capture of this strong position.

The lessons of this episode are :—

1. The utility of reconnaissance.
2. The advantage of an enveloping movement.
3. The necessity of fixing a definite limit to each section of the ground—the reason that the Russians had not patrolled the Sha-ho, was that neither of the two sections concerned looked upon this part of the ground as within their own province.

After settling the plan of attack, the next thing is to prepare to carry it out. All troops move at night to their preliminary positions, and are prepared to advance at dawn. This was the invariable Japanese method.

The minimum distance from the enemy, to which infantry can advance at night is perhaps 1,000 *mètres*. For artillery effective range is sufficient. In daylight infantry will be compelled to deploy at 4,000 *mètres*. After this open formations are necessary, and losses will be appreciable.

What should the first action be in the attack ?

The English procedure at Colenso and elsewhere is well known. A vigorous cannonade preceded the infantry attack. But the effects of the artillery fire were most disappointing, and the infantry found an unshaken enemy before them.

At the beginning, the Japanese followed this example. At the Yalu their artillery silenced the weaker enemy's guns before the infantry advanced. But the Russians did not permit a repetition of the experiment.

In subsequent engagements the Russian batteries ceased fire as soon as they began to feel their inferiority, only to start again when opportunity offered.

The result was that it was found impracticable for the infantry to await the conclusion of the artillery duel. The infantry had to advance to within effective range in order to unmask the position of the enemy's batteries, for these latter never showed, except under infantry fire.

But the artillery's duty remains, as before, to destroy the enemy's guns, or at least to prevent their damaging the infantry.

As soon, therefore, as there is sufficient light in the morning, the infantry advances. The object is to get within effective range

as soon as possible. The advance consists of a series of rushes. As soon as the desired object is attained, the men lie down and take cover, entrenching if necessary. Then comes the fire combat.

The Japanese, however, always endeavoured to shorten the fire combat if possible. If necessary, they lay in the position attained till night, and then assaulted with the bayonet. Sometimes the first night attack only brought the assaulting line a hundred or so yards nearer the enemy and a second line of entrenched positions would be necessary. A second day would be spent in fire combat and a second night in a final assault.

The generality of the reports fix the distance of the assault at from 400 to 200 *mètres* from the enemy's position, up to this point the advance has been a series of rushes, but from this point one single rush to the enemy's line must be made.

Throughout the attack the artillery supports the infantry by keeping down the fire of the enemy's artillery.

The chiefs of the staffs in the three divisions of the II Army all give it as their opinion that the artillery must devote its whole attention to the defender's batteries, only a small portion being relieved of this duty to give on the enemy's infantry. During the assault a few batteries should advance, as far as possible, and fire over the heads of their own infantry until the last possible minute. It is true that there is a considerable chance of hitting your own troops, but the Japanese at least prefer that risk to the absence of the artillery support.

It should be noted that the hand to hand combat is no longer merely a threat; whether the assault is made by night or by day, the bayonet and the hand grenade are the last resort.

From the actual facts of war two points appear to be clear:—

If the defender receives fire on two fronts, if his cover and shelter is bad or if he is in very inferior numbers he will abandon the position before the menace of the assault.

If his entrenchments are strong, his flanks well covered, and he is not too demoralised by the attacker's fire, he will await the assault with a good heart, and it is then that the hand to hand fighting decides the event.

As has been pointed out the Japanese system invariably consisted of an enveloping movement. If the object of the attack were a redoubt supported by other works, then the neighbouring troops occupied the attention of the said other works, while the enveloping party penetrated the line, with the idea of reaching the gorge of the redoubt.

Destruction of the defender's obstacles must necessarily precede an assault. This operation must usually be carried out at night.

Lastly, and above all, a firm determination to win, and not to recoil before any sacrifice is necessary. The value of the troops' morale cannot be over-estimated in its importance as a factor.

The episode at Mukden is a striking example.

The 21st Japanese regiment of the 6th Division started to attack a Russian redoubt at 10 A.M. The garrison consisted of one regiment and 2 machine guns. The advance was made by two battalions in line, each with 3 companies deployed, and the fourth in échelon as a reserve, but also deployed. The advance was made under a murderous fire, both from infantry and artillery. At 800 paces from the enemy the reserve companies came up into the firing line. This brought the Japanese to a point some 300 to 400 paces from the redoubt. Further advance was impossible. The loss in an hour had been 304 killed and 965 wounded out of a strength of 2,500 officers and men.

The men lay down, scraped up the earth with their spades, filled the sacks they carried, thus making some sort of cover. They ceased firing, but remained where they were. Meantime the Russian artillery prevented the third battalion of the regiment, which was in reserve behind a village, from coming up. The Japanese, however, held on to their position till night-fall, when the third battalion was able to come up.

During the night the Russians received orders to retire, and at dawn their rear-guard was easily driven out of the work.

One point remains. The signal for the assault. This usually comes either from the chief commander, or from a commander of a section, in his section. It seldom comes from the firing line. The latter reports when it appears to be sufficiently advanced, and the authorities decide. Lastly comes the question of pursuit. It is obvious that after the position is won, the first thing to do is to seize the opportunity and organize the pursuit. The Japanese do not appear to have undertaken any pursuit, and accordingly never reaped the full advantages of their victories.

The August number contains little of general interest, beyond a note in the correspondence that the prophecy in the May number that a referendum on the new law would be demanded has been fulfilled. The result thereof is, however, yet to be seen.

GERMAN PAPERS.

Militär Wochenblatt.

The most noteworthy article in the September number of this paper is "The Armed Strength of Abyssinia" of which a précis is given below:—

The standing army of Abyssinia is composed of the Imperial troops and those of the Tributary States.

The Imperial troops are immediately under the Emperor Menelik, they are maintained by him and led by commanders appointed by him. They consist of the troops that are accommodated in the Imperial Residences and those detached and placed at the disposal of the feudatory princes of the Tributary States. They are organized into regiments (Sendi) of 300 to 1,000 men (seldom more). The rank of regimental commanders varies according to the strength and importance of the regiment concerned. The regiments of Menelik's Body-Guard are commanded by those men of the most distinguished military attainments. The provincial regiments are commanded by "Balambarassi." (Fortress Commandants.)

The regiments are divided into companies of 100 men (Meto) and these are again divided into half companies of 50 men (Amsa). The "Amsa" is the smallest tactical and self-contained unit in the army; it is divided into 5 sections of 10 men each, under a non-commissioned officer (Aleka). The Imperial troops consist of—

10 regiments of the Imperial Guard the "Snajderjashi" and "Gondari" also a complement of artillery.

The Imperial Artillery consists of—(1) 4 mountain batteries, each with 6, 53 *mm.* Hotchkis guns. Each gun is carried on 4 mules (1 for the barrel, 1 for the carriage, 1 for the wheels, 1 for 40 rounds of shrapnel); 1 mountain battery with 4 Austrian 7 *cm.* guns and also 60 Italian 75 *mm.* mountain guns.

(2) 2 batteries each with 6, 8 *cm.* muzzle-loaders, 2, 8 *cm.* Italian breech-loaders, 2 Krupp 8 *cm.* guns of position mounted on siege carriages, captured from the Egyptians in 1876. This heavy artillery is mounted in the Fortress of Golla near Ankober and is provided with an ample supply of ammunition.

(3) The machine gun detachment of the Negus, which consists of a few machine guns of American make and 2 maxim guns. These guns are used in peace time for the personal protection of Menelik and are always parked in the vicinity of his tents.

(4) The Negro Company composed of 200 Negro prisoners of war, who are trained by European instructors.*

* Ras Olde-Georgis, the ruler of the Tributary State of Kaffa, has a similar company at his disposal.

The 21st Japanese regiment of the 6th Division started an attack a Russian redoubt at 10 A.M. The garrison consisted of 1000 men, 10 machine guns, 2 machine guns. The advance was made by 3 battalions in line, each with 3 companies deployed, and the 4th in echelon as a reserve, but also deployed. The advance was made under a murderous fire, both from infantry and artillery. At 10.30 p.m. from the enemy the reserve companies came up into the 1st line. This brought the Japanese to a point some 300 to 400 paces from the redoubt. Further advance was impossible. The loss in an hour had been 304 killed and 965 wounded out of a strength of 2,500 officers and men.

The men lay down, scraped up the earth with their sticks, filled the sacks they carried, thus making some sort of cover. The ceased firing, but remained where they were. Meantime the Russian artillery prevented the third battalion of the regiment, which was in reserve behind a village, from coming up. The Japanese, however, held on to their position till night fall when the 4th battalion was able to come up.

During the night the Russians received orders to retire. At dawn their rear-guard was easily driven out of the work.

One point remains. The signal for the assault. This may come either from the chief commander or from a commander of a section, in his section. It seldom comes from the firing line. The latter reports when it appears to be sufficiently advanced, and the authorities decide. Lastly comes the question of pursuit. It is obvious that after the position is won, the first thing to do is to seize the opportunity and organize the pursuit. The Japanese do not appear to have undertaken any pursuit, and accordingly never secure the full advantages of their victories.

The August number contains little of general interest. A note in the correspondence that the prophecy in the May number that a referendum on the new law would be demanded has been fulfilled. The result thereof is, however, yet to be seen.

ARMED STRENGTH

THE ARMED STRENGTH OF ABYSSINIA

The most noteworthy feature of the Armies of this paper is "The Armed Strength of Abyssinia" which a précis is given below —

The standing army of Abyssinia is composed of the Imperial troops and those of the Tributary States.

The Imperial troops are immediately under the Emperor Menelik they are maintained in the hands of commanders appointed by him. They consist of the troops that are accommodated in the Imperial Residences and those stationed and placed at the disposal of the tributary princes and Tributary States. They are organized into regiments (Send) each of 1000 men (Send). The rank of regimental commanders varies according to the strength and importance of the regiment concerned. The regiments of Menelik's Body-Guard are commanded by those men of the most distinguished military attainments. The regimental regiments are commanded by "Balambarass" (Fortress Commanders).

The regiments are divided into companies of 100 men (Kor). and these are again divided into battalions of 50 men (Kor). The battalion is the smallest tactical and administrative unit and is divided into 5 sections of 10 men each (Kor). The Imperial troops are divided into 10 regiments.

The regiments of the Imperial Guard are the 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th.

The Imperial Army consists of 100,000 men (Kor). and is divided into 100 regiments (Send). Each regiment is commanded by a "Balambarass" (Fortress Commander). The Imperial Army is divided into 100 regiments (Send). Each regiment is commanded by a "Balambarass" (Fortress Commander). The Imperial Army is divided into 100 regiments (Send). Each regiment is commanded by a "Balambarass" (Fortress Commander).

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level in $21\frac{1}{2}$ seconds. The greatest speed attained was 82 *metres* per second in $7\frac{1}{8}$ seconds, that is, 42 *kilometres* ($26\frac{1}{4}$ miles) an hour.

In the course of last winter Dumont built another "dragée" to which he gave the name of "Bird of Prey 2nd," in the hope that with it he might attain his object more quickly. All that is known about its construction is that the supporting sails are made of wax and that the motor develops 100 horse-power. The trials were taken with this machine in March and April of this year from the "Balloon Hall" near the parade ground of St. Cyr in the presence of numerous officers, and of the donors of the prize were likewise unsuccessful, so much so that Dumont has again taken up his flying-machine, the "Bird of Prey."

But ill-luck overtook this one too in the trial undertaken only again a short time ago. After going a distance of 30 *metres* (32 yards) against the wind, the flying machine rose easily to a height of $11\frac{1}{2}$ *metres* (5 feet), but it was soon evident after a short trip that its stability left much to be desired. As soon as it had traversed a distance of 50 to 60 *metres* (55 to 65 yards) in the air it suddenly made a half turn, and inclined so much towards the earth that the wing struck the ground. The consequence was that the machine grounded with a sharp shock, and Santos Dumont was buried beneath the broken parts of the wings. As the damages only affected the supporting sails and one of the wheels, and moreover both the motor and air screw remained intact, Dumont hoped within a short time to be able to repair the machine, and then subsequently to resume his trials.

This has certainly not come to pass up to the present. For the French professional press one reads that the task which Dumont has set himself as indeed his experiences up to date have shown him, is one impossible of accomplishment, for for many reasons he will never succeed in turning round in a wind back to the starting place.

In the place of Dumont's machines an aeroplane of 18 *metres* length, which is a two-decker after the Dumont system is being tested. It is great deal at the present time in France. The first ordinary trials on the parade ground of Vincennes are now being followed by others on the parade ground of Longchamp, in the course of which 67 *metres* (73 yards) have been traversed in a flight.

The flying machine of the American Brothers Wright, to which so much has been written of late, especially in the English press, we have intentionally left out of consideration as the test accounts of it vary so greatly. We have, as a matter of fact, regarded as important the report that the German Emperor had bought the American invention, a fact which the entire press has announced. This news has just been denied from America with the corollary that this flying machine has been acquired by the Government of the United States at a cost of over 500,000 marks (22,500,000 francs), but the inventors are pledged to further secrecy of the purchase, as it is being worked towards completion for practical use.

In connection with all these weighty experiences in the field of modern aeronautics, the pointing seems relevant to the conclusion that, the more general becomes the intention to make use of this method in military aims for finding out the measures, etc., which the enemy is taking, so much the more must a study be made of preventive measures with which the disadvantages to the army of these annoying "points of vantage" can be countered.

As has already been the case for some years in Germany and France, trials have now taken place in Austria at the School of Gunnery for Fortress Artillery in shooting at captive balloons with so-called "balloon-batteries" from 12 *centimetre* guns on wheeled gun-carriages. The results attained by these batteries in some 12 trials are said to have been that in 10 cases, after a period of 10 minutes at the most, the greatest number of shots being 40, the balloon was on each occasion brought to the ground.

Germany has gone a step further, for there people have been wrestling with the question of the effective fighting of dirigible balloons. It was first of all a question of a 5-*centimetre* armoured automobile gun detailed for this purpose : this was on view at last year's automobile exhibition in Berlin. Against this gun the objection chiefly raised was that its efficacy was not sufficient, for it was lacking in adequate range and hitting capacity, and above all had not a good shrapnel. An article which made its appearance in the *Militär Wochenblatt* demanded an effective gun, which brings up both its crew and ammunition by means of unarmoured, quick-moving, and strong wagons, which would have to serve as limbers or platforms, to a suitable place from which to shell the balloon, and would there remain under cover.

A field gun of this pattern is in course of construction at Krupp's works and this indeed in the form of a 6·5-*centimetre* gun L 35 on a recoiling carriage, in which the trunnions, as is the case with the later types of howitzers and mountain guns, are placed in rear, and which permits of an elevation to the barrel of 60°. The weight of the projectile is 4·3-*kilogrammes* (that of the cartridge being about 5·9 *kilogrammes*), and the muzzle velocity, if one demands on the one hand that the weight of the gun should not exceed 950 *kilogrammes*, and on the other that an absolute stop at less than 10° elevation does not appear requisite, would amount to about 600 *mètres* (1,950 feet) a second. To enhance the rate of fire a semi-automatic lock is made use of.

In view of the great importance, which the subject here alluded to has both for the science of modern shooting as well for aeronautics, its further development, especially with regard to the later results of shooting especially with the proposed 6·5-*centimetre* gun may be awaited with close attention.

PRECIS OF FOREIGN MILITARY PAPERS.

FRENCH PAPER.

Revue Militaire Suesse, April 1907.

The July number opens with an interesting article: "The attack of fortified positions in Manchuria."

The author bases his remarks on articles in various magazines, but deals chiefly with the second army under Oku, which, on several occasions, was compelled to make attacks in the open on fortified positions.

The first condition of success, it appears, is orientation. All authorities agree in this.

The exact position of the enemy, and particularly of his artillery, must be determined by officers' patrols, or other means, with the greatest care. Thus before the Yalu the Japanese sent out Chinese and Korean spies, and organised an active service of patrols along the river. A telescope was installed in a temple on an elevation on the bank. In the result when the battle began the Japanese authorities were informed in full detail of the extent of the enemy's position, his works and the position of his reserves. It is true that the negligence and apathy of the Russians gave the Japanese considerable advantage in obtaining the information.

But the reconnaissance of the enemy's position alone is not sufficient. The ground over which the attack will pass, the communications, the artillery positions, etc., must be minutely examined. If necessary the enemy's advanced posts must be driven in.

The plan of attack is the next operation. The chief commander divides up the ground, apportions the troops and informs each commander of a section of ground of the object in view. These latter then carry out their own reconnaissances.

The favourite Japanese plan, and one well understood throughout the army, was a combination of a frontal attack and an enveloping movement on a flank. The following is an example of a reconnaissance and subsequent attack.

During the battle of the Sha-ho, the 11 Japanese Army formed the left wing of the line. The 3rd Division was along the railway, the 6th on the Sha-ho, and the 4th between the Sha-ho and the Hine-ho.

On the 11th October the advanced Russian troops fell back in the line Shilihe-Enteniulu-Tontai, which had been strongly fortified. A regiment of the 3rd (Japanese) Division seized Enteniulu during the night of the 12th October, but was unable to hold it. Two more regiments attacked Tontai. At the same time the reserve (two regiments) was in the deep bed of the Sha-ho. The commander of the leading regiment sent out an officer's patrol along the bed

of the river. This patrol reported that the bed was not occupied by the enemy. The commander at once decided to advance along the bed. This was done under great difficulties, and very slowly, the reconnaissance officer acting as guide. Eventually the regiment took itself within 50 paces of the Russian trenches, and directed an attack from the rear. A sudden fire by the Japanese drove the Russians into the village with great loss.

In the result as soon as the Japanese frontal attack began the Russians evacuated Tontai, thus compelling the abandonment of Entemuh. The Russian front was enveloped.

The Japanese flank attack had thus ensured the capture of this strong position.

The lessons of this episode are:—

1. The utility of reconnaissance.
2. The advantage of an enveloping movement.

3. The necessity of fixing a definite limit to each section of the ground, the reason that the Russians had not patrolled the Sha ho was that neither of the two sections concerned looked after this part of the ground as within their own province.

After settling the plan of attack the next thing is to prepare to carry it out. All troops move at night to their proper positions, and are prepared to advance at dawn. This was the reliable Japanese method.

The minimum distance from the enemy to which infantry can advance at night is perhaps 1000 *metres*. For artillery effective range is sufficient. In daylight infantry will be compelled to advance at 4000 *metres*. After this open formations are necessary, and losses will be appreciable.

What should the first action be in the attack?

The English procedure at Colenso and elsewhere is well known. A vigorous cannonade preceded the infantry attack. But the effects of the artillery fire were most disappointing and the infantry found an unshaken enemy before them.

At the beginning the Japanese followed this example. At the Yalu their artillery scored the weaker enemy's guns before the infantry advanced. But the Russians did not permit a repetition of the experiment.

In subsequent engagements the Russian batteries ceased to act as soon as they began to feel the infantry only to start again when opportunity offered.

The result was that it was found impracticable for the infantry to attack the enemy without the artillery aid. The infantry had to advance to within effective range in order to turn back the position of the enemy's batteries, for these latter never showed except under infantry fire.

But the artillery duty remains, as before, to destroy the enemy's guns or at least to prevent the following of the infantry.

As soon as there is a pause, as there is sufficient light in the morning, the infantry advances. The object is to get within effective range

as soon as possible. The advance consists of a series of rushes. As soon as the desired object is attained, the men lie down and take cover, entrenching if necessary. Then comes the fire combat.

The Japanese, however, always endeavoured to shorten the fire combat if possible. If necessary, they lay in the position attained till night, and then assaulted with the bayonet. Sometimes the first night attack only brought the assaulting line a hundred or so yards nearer the enemy and a second line of entrenched positions would be necessary. A second day would be spent in fire combat and a second night in a final assault.

The generality of the reports fix the distance of the assault at from 400 to 200 *mètres* from the enemy's position, up to this point the advance has been a series of rushes, but from this point one single rush to the enemy's line must be made.

Throughout the attack the artillery supports the infantry by keeping down the fire of the enemy's artillery.

The chiefs of the staffs in the three divisions of the II Army all give it as their opinion that the artillery must devote its whole attention to the defender's batteries, only a small portion being relieved of this duty to give on the enemy's infantry. During the assault a few batteries should advance, as far as possible, and fire over the heads of their own infantry until the last possible minute. It is true that there is a considerable chance of hitting your own troops, but the Japanese at least prefer that risk to the absence of the artillery support.

It should be noted that the hand to hand combat is no longer merely a threat: whether the assault is made by night or by day, the bayonet and the hand grenade are the last resort.

From the actual facts of war two points appear to be clear:—

If the defender receives fire on two fronts, if his cover and shelter is bad or if he is in very inferior numbers he will abandon the position before the menace of the assault.

If his entrenchments are strong, his flanks well covered, and he is not too demoralised by the attacker's fire, he will await the assault with a good heart, and it is then that the hand to hand fighting decides the event.

As has been pointed out the Japanese system invariably consisted of an enveloping movement. If the object of the attack were a redoubt supported by other works, then the neighbouring troops occupied the attention of the said other works, while the enveloping party penetrated the line, with the idea of reaching the gorge of the redoubt.

Destruction of the defender's obstacles must necessarily precede an assault. This operation must usually be carried out at night.

Lastly, and above all, a firm determination to win, and not to recoil before any sacrifice is necessary. The value of the troops' *morale* cannot be over-estimated in its importance as a factor.

The episode at Mukden is a striking example.

The 21st Japanese regiment of the 6th Division started an attack a Russian redoubt at 10 A.M. The garrison consisted of one regiment and 2 machine guns. The advance was made by two battalions in line, each with 3 companies deployed, and the third in echelon as a reserve, but also deployed. The advance was made under a murderous fire, both from infantry and artillery. At 80 paces from the enemy the reserve companies came up into the firing line. This brought the Japanese to a point some 300 to 400 paces from the redoubt. Further advance was impossible. The loss in an hour had been 304 killed and 965 wounded out of a strength of 2,500 officers and men.

The men lay down, scraped up the earth with their spears, filled the sacks they carried, thus making some sort of cover. They ceased firing, but remained where they were. Meantime the Russian artillery prevented the third battalion of the regiment which was in reserve behind a village, from coming up. The Japanese, however, held on to their position till night fall, when the third battalion was able to come up.

During the night the Russians received orders to retire. At dawn their rear-guard was easily driven out of the work.

One point remains. The signal for the assault. This usually comes either from the chief commander or from a commander of the section, in his section. It seldom comes from the firing line. The latter reports when it appears to be sufficiently advanced, and the authorities decide. Lastly comes the question of pursuit. It is obvious that after the position is won, the first thing to do is to seize the opportunity and organize the pursuit. The Japanese do not appear to have undertaken any pursuit, and accordingly never realize the full advantages of their victories.

The August number contains little of general interest, but a note in the correspondence that the prophecy in the May number that a referendum on the new law would be demanded has been fulfilled. The result thereof is, however, yet to be seen.

GERMAN PAPERS.*Militär Wochenblatt.*

The most noteworthy article in the September number of this paper is "The Armed Strength of Abyssinia" of which a précis is given below:—

The standing army of Abyssinia is composed of the Imperial troops and those of the Tributary States.

The Imperial troops are immediately under the Emperor Menelik, they are maintained by him and led by commanders appointed by him. They consist of the troops that are accommodated in the Imperial Residences and those detached and placed at the disposal of the feudatory princes of the Tributary States. They are organized into regiments (Sendi) of 300 to 1,000 men (seldom more). The rank of regimental commanders varies according to the strength and importance of the regiment concerned. The regiments of Menelik's Body-Guard are commanded by those men of the most distinguished military attainments. The provincial regiments are commanded by "Balambarassi." (Fortress Commandants.)

The regiments are divided into companies of 100 men (Meto) and these are again divided into half companies of 50 men (Amsa). The "Amsa" is the smallest tactical and self-contained unit in the army; it is divided into 5 sections of 10 men each, under a non-commissioned officer (Aleka). The Imperial troops consist of—

10 regiments of the Imperial Guard the "Snajderjashi" and "Gondari" also a complement of artillery.

The Imperial Artillery consists of—(1) 4 mountain batteries, each with 6, 53 mm. Hotchkis guns. Each gun is carried on 4 mules (1 for the barrel, 1 for the carriage, 1 for the wheels, 1 for 40 rounds of shrapnel); 1 mountain battery with 4 Austrian 7 cm. guns and also 60 Italian 75 mm. mountain guns.

(2) 2 batteries each with 6, 8 cm. muzzle-loaders, 2, 8 cm. Italian breech-loaders, 2 Krupp 8 cm. guns of position mounted on siege carriages, captured from the Egyptians in 1876. This heavy artillery is mounted in the Fortress of Golla near Ankober and is provided with an ample supply of ammunition.

(3) The machine gun detachment of the Negus, which consists of a few machine guns of American make and 2 maxim guns. These guns are used in peace time for the personal protection of Menelik and are always parked in the vicinity of his tents.

(4) The Negro Company composed of 200 Negro prisoners of war, who are trained by European instructors.*

* Ras Olde-Georgis, the ruler of the Tributary State of Kaffa, has a similar company at his disposal.

The "Snaiderjashi," about 60,000 men, form the pick of the Abyssinian army and are used to garrison the fortresses as well as the crown estates of the Negus situated in the Kingdom of Shoa.

The "Gondari," between 2,000 and 8,000 men, are those Imperial troops detailed for service at the courts of the feudatory princes. They really serve to uphold the dignity of the Emperor and more especially in those principalities situated in the centre of the Kingdom.

The troops of the feudatory princes have a similar organisation to those of the Emperor. In 1905, they are said to have numbered 80,000 men with 23 guns. The most powerful vassals, Ras Makonnen of Harrar and Ras Mikael of Wallo each have 20,000 men at their disposal and Ras Olde-Georgis of Kaffa 15,000. Other tributary chiefs follow with, 12,000, 8,000, 6,000, 5,000 and 4,000 warriors, and there are various others with forces of less than 4,000 men.

Besides the Imperial and feudatory troops the "Gyndebel" troops (also written Gindevel) are available. These are only called up for service on war breaking out and in return for their services receive grants of land for cultivation from the Negus. They are employed in the Transport Service of the army and as garrison troops. Their number is estimated at 40,000 to 50,000.

Volunteers are called "Fanno" troops. They have no regular organisation and serve under independent leaders.

Lastly there is the *Levéé en masse* "Je-Ager-Tor" for which every man capable of bearing arms is liable. Abyssinia is in a position to place about 200,000 men in the field on a war footing.

The standing army of Abyssinia is recruited entirely from volunteers, who flock to the colours in great numbers owing to the warlike spirit of the nation. Compulsory enlistment is not necessary, though Menelik for some time was obliged to take strong measures to prevent the emigration of recruits from the vicinity of the capital to the southern districts. The reason for the disinclination to serve in the neighbourhood of the capital was to be found in the hard work that Menelik demanded of his troops in the construction of public works.

The article on "The Armed Strength of Abyssinia" is continued in one of the October numbers, and the following is a summary of the writer's account :—

There is no clear distinction between cavalry and infantry in the Abyssinian army. On the march, in camp and in action horsemen and footmen are mingled together in a confused mass. About nine-tenths of the army are on foot, and only some of the leaders and older soldiers ride on horses or mules. The mounted contingent only act as a separate unit for foraging and reconnoitring purposes, and also in pursuit.

The marching capacity of Abyssinian soldiers is extraordinarily high. Their average rate of marching is 6 kilometres in the hour, and a march of 70 kilometres in the day is not considered anything out of the way. In 1899, in the campaign against Ras Managashi,

Menelik's army marched for 10 days consecutively, and on each day 10 to 12 hours were occupied in marching. A few individuals covered a distance of 500 kilometres in 8 days!

Another excellent quality of the Abyssinian is his natural aptitude for making the best use of cover under any circumstances. The hunter's life he leads from the time of his youth up, no doubt strongly helps to develop this quality.

Musketry training stands at an extremely low level. The Abyssinians have no idea of firing beyond point-blank range, and do not cumber themselves with the intricacies of the back sight and firing with different elevations. Many of them remove the leaf of the back sight altogether, and content themselves with fixed sights.

The manœuvring capacity of Abyssinian troops is also extremely slight. They march together in a disordered mass, and the regimental units only begin to show a separate grouping after they have settled down in camp. It is the same in action. Once committed to the fight, the leaders lose all control over their units which mingle together in one irregular horde.

As mentioned above, there is no sort of regular cavalry. The horse is looked on chiefly as a means of transport, but the Abyssinian is a good rider and fond of horses, and for the ordinary purposes of mounted infantry the mounted soldiers are of no small value.

The Abyssinian artillery has a separate organization. They wear a different uniform from the others, and both on the march and in battle they endeavour to keep apart from the other fighting masses, and to play an independent rôle. The greater portion of the artillery consists of Italian mountain batteries, but the guns are kept in very indifferent condition. The men are hardly ever exercised in handling their guns, and owing to the expense of ammunition the guns are never fired for practice, except on certain big festival days when a few rounds of blank are fired as salutes.

The infantry are armed with rifles and ammunition of numerous patterns, as the Abyssinians are entirely dependent on Europe for their supply of arms. The army possesses patterns of every description, Gras, Berdan, Winchester, Mauser, Martini, etc. The French Gras rifle and the Russian Berdan are the most common.

Two or three different patterns of swords are also in common use. The former principal weapon, the lance, is now only carried as a warlike insignia chiefly by the Gallas section of the population.

The round, convex, and leather-covered shield is still used by the Abyssinians as a weapon of defence.

The dress of the soldier is very simple. It consists of cotton shirt and drawers held together by a 'kummerband' to which the ammunition bag is attached. Over this a square piece of cotton cloth, called the "Shamma," is picturesquely draped round the body. In the cold season, this costume is supplemented by a woollen 'Burnus' or overcoat, which also provides head-covering.

A concluding article on "The War Strength of Abyssinia" is promised in a future number.

An article on the "Philosophy of War" reviews a book bearing the same title by Dr. Rudolph Steinnetz. The views enunciated in the book are decidedly contrary to those of the advocates of universal peace, as may be seen from the following extract with which the article concludes:—

"Short-sighted visionaries à la Tolstoi have tried to persuade us that war is merely the outcome of brutality and cruelty, whereas in reality it is the highest possible development of power and energy in a nation, whose fitness for survival can be tested and proved by war alone. Further, war is also the highest and most just of arbitrators, since those nations remain victorious, who in consequence of their superior fitness dispose of the most powerful means ensuring victory, viz., greater wealth and population, sound government and the happy political condition resulting therefrom, and, finally, an advanced state of civilisation and a high standard of physical and moral qualities. To do away with war would, therefore, mean that a State would be robbed of its highest test of strength and the chief preservative of its greatness, seeing that the latter can only be maintained by constant fighting. It may not be possible to affirm that this is a benefit to the human race, but there can be no satisfactory substitute for war because war means the highest possible effort of strength."

The above is the concluding argument of the book, but the author in various details makes some striking points against a number of exaggerations which have been assiduously promulgated by fanatical opponents of war. He shows by statistics, for instance, that the general mortality only slightly increases in war time, that only the small fraction of the population inhabiting the area of hostilities is exposed to the horrors and sufferings of war, that experience proves that the vanquished very soon recover from the effects of their defeat, while the victor acquires a rapid and unmistakeable upward impulse in every sphere of development.

"*A new intrenching tool*" is the title of an article discussing the familiar problems connected with the equipment of each soldier with an intrenching implement. The difficulty of combining the functions of pick, axe, spade, and, if possible also wire-cutter, in one single implement, which further requires to be light, portable, strong, simple, handy, and capable of withstanding the roughest usage, is recognised to be very considerable. No definite suggestion is made as to the form the implement should take, but some interesting conclusions are nevertheless arrived at. The writer suggests that the bayonet and its scabbard should be done away with as a side-arm, and its place taken by the intrenching tool. The latter would be attached to the belt by means of a clip or similar contrivance. The intrenching tool would thus be conveniently carried, and could be brought into use and replaced with the least possible effort or trouble in any position the soldier may happen to be in. Straps and slings

of **any** kind should be regarded as an evil. As for the bayonet it **should** be light and short, and carried as part and portion of the rifle. (**How** this is to be done, the writer does not explain.)

In view of the fact that the British army has just introduced a **longer** and heavier bayonet, it is noteworthy that German military **opinion** seems to favour a bayonet of exactly the opposite description.

ITALIAN PAPERS.

[*Rivista d'Artiglieria e Genio*, March 1907.]

Machine-guns with the Japanese Cavalry in the late war.

In the matter of armaments in the various armies, a much discussed question at the present time is the adoption of machine-guns, and the organisation of the troops armed therewith. In this, as in other similar arguments, the lessons drawn from the Russo-Japanese war are capable of furnishing valuable advice, although the conclusions arrived at are not always the same. For instance the Japanese were led by their experience to institute four-gun batteries of machine-guns, while the Russians have broken up their machine-gun companies into small parties or detachments.

In any case it is certain that whatever may be the method of distributing these weapons, the necessity for their adoption becomes more insistent every day. If, however, the machine-gun is considered, not as a special arm requiring its own particular troops, but as an efficient means of increasing the fire effect of the rifle, it appears to be only logical (as is now generally held by competent authorities) that these weapons should be assigned in greater or less proportion to the infantry and cavalry units themselves, without losing sight of their value for reconnaissance.

In proof of this it may be well to remember the words of the Japanese Captain Matsuda, who commanded a machine-gun detachment, in the late war, which was attached to Prince Kanine's cavalry brigade. His report is briefly as follows:—

The cadres for machine-gun detachments were prepared in March 1904, and in May when the the 2nd Cavalry Brigade (Kanine) was mobilised, they were completed with the necessary personnel to form a detachment of six guns, which was ready in six days. This consisted of two guns drawn by four-horse teams, four guns on tripods and six ordinary artillery wagons for the ammunition. In the middle of June one-horse vehicles were substituted which entailed fresh instruction of the personnel and also of the horses (to teach them to stand fire).

This equipment proved defective by reason of the instability of the carriages, and their small carrying capacity which involved frequent reloading, especially at high rates of speed.

The consequent inconvenience was so great that Matsuda, although he recognised the greater weight of the four horse guns, asked for six of the latter type. With these he exercised his men until the embarkation in the middle of August.

The detachment could hardly be called ready. The horses worked badly in draught, and the men, though well instructed as to

jams in the mechanism, were far from equally trained in firing. But during the march to the front, and afterwards during a lull in the operations, an attempt was made to complete the training.

The detachment disembarked at Dalny at the end of August 1904, and started for Liao Yang. The march was slow and difficult, on account of the bad condition of the roads, which in some parts were ruined by rain, and in others rocky and hilly. So that the guns did not join the 2nd Cavalry Brigade (at Kaio) till the 21st September. However, this march served to show that the equipment was too heavy, and unsuitable for machine-guns acting with cavalry.

On Captain Matsuda's proposal, Prince Kanine gave orders for the construction of experimental tripod mountings to replace the carriages, and for trials with an entire pack transport equipment. In a few days two wooden mountings were constructed, which gave excellent results when used for practice. After this the whole six machine-guns were mounted in this way, and used with pack transport.

On the 28th September two guns accompanied a reconnaissance of the 16th Cavalry Regiment. The consequence of this was that it was considered advisable to modify the loads. Meanwhile the Russians had started the offensive operations, which lead up to the actions in October known as those of the Sha-ho. It was found necessary to employ four horse-drawn machine-guns, and this proved once and for all that that system was unsuitable.

When on the 9th October the 2nd Cavalry Brigade received orders to move from Kaio to Pensiho by the direct way of Sakkochi and Kiaoto, the machine-guns were prevented from following by the condition of the roads, and were therefore compelled to make a long detour without an escort along the left bank of the Taitseho, involving 70 km. of marching in place of 35. But even so they were obliged to halt a few miles from Pensiho, because the vehicles could not climb the Chenchonilin ridge.

In the meantime the extreme left of the Japanese army (the 12th Brigade of the 12th Division, commanded by General Chima-mura), was offering a determined resistance to the eastern group of the Russian forces, which was attacking from the north and east on the right bank of the Taitseho. At the same time the Russian cavalry crossing to the left bank (Samsonoo's division) was threatening Pensiho from the south. The 2nd Brigade now crossed the Chenchonilin ridge, and came to the assistance of the Japanese.

Captain Matsuda, who saw what effective aid his machine-guns could have rendered at this difficult moment, took the energetic resolution to leave the carriages behind, and to transport four guns by hand on to the field of battle, together with three tripod mountings, and the ammunition required. All the equipment which could not be moved was left on the south side of the ridge. It was not till the morning of the 11th that the machine-guns could be employed (in an affair between the 15th Japanese Cavalry Regiment

and two Russian battalions). But according to Matsuda himself they could have gone into action far sooner had the equipment been lighter and more portable.

During the suspension of operations which followed the October battle, the 2nd Cavalry Brigade went to reinforce the extreme right wing of the Japanese army, and the section of machine-guns was sent with the outposts.

The various attempts made during the winter to improve the transport of these weapons failed to give satisfactory results. Lastly in the last days of January the detachment was provided with pack equipment; shortly afterwards the 2nd Cavalry Brigade moved from the extreme right to the extreme left of the Japanese front.

During the development of the operations round Mukden, from the 29th February to the 20th March, the machine-gun detachment was continually on the march, and experienced no difficulties. This was the effect of the new equipment. Only five horses were slightly galled from the loads, although tactical necessities compelled the detachment to be always prepared for action.

One section covered 44 kilometres in five hours, but the horses with gun loads did not appear to be more fatigued than the riding horses.

These experiences of Captain Matsuda's detachment were repeated with little variation in the other cases, and all agreed in considering the draught equipment as unsuitable, the more so as the guns could not be taken right to the front to any convenient position by the teams, and the equipment was too heavy to be man-handled.

Another type of equipment, which was used in the Japanese army, consisted of two-horse teams, and was light and mobile, but had to be abandoned as being too weak, and incapable of fast travelling.

Matsuda concludes by giving the preference to a pack equipment, as being independent of the nature of the ground, and capable of advancing right up to the firing line if necessary. The sole drawbacks are the time occupied in loading and unloading the horses, and the small allowance of ammunition permissible.

Captain Matsuda considers that his experience in the campaign warrants his laying down that 9,000 rounds per machine-gun would be sufficient, even for a lengthy action. As a matter of fact, on the 3rd March 1905, one section expended 22,000 rounds, another 15,000 and a third 3,600, or a total of 40,600 rounds, that is, 6,700 per gun. A very heavy fire was kept up, so much so indeed as to give grounds at the time for believing that the whole allowance of 25,000 rounds per gun would be expended.

A fact which shows the great importance of adequate training for the personnel is that while at Pensiho, on the 12th October 1904, jams began to occur after about 1,800 rounds per gun, on the other hand on the 3rd March 1905, not a single hitch took place though the guns fired 11,000 rounds apiece.

*April 1907***Guns and Gas Motors.**

It was the expansion of the products of combustion of gunpowder that furnished Hautefeuille, Huygens and Denis Papin with the motive power of their first *fire engines*. Their inventive genius was busied equally with constructing industrial motors, and with finding a method of propelling projectiles to long distances.

These primitive machines were atmospheric, like that of the Marquis of Worcester, and depended on the vacuum produced by the cooling of the gases generated by the explosion of gunpowder. Denis Papin, observing that steam when condensed furnished a better vacuum, was induced to abandon the gunpowder machines in favour of steam. But the idea of utilising the expansive power of explosives to move a piston in a cylinder attracted numerous inventors, who were encouraged by the wonderful results obtained with fire-arms.

In fact, if the matter is carefully considered, the problem is exactly the same with an explosive motor as with a gun. It is that of introducing an explosive charge into a closed chamber, and applying a light to it. The explosion develops a large volume of gas at a high temperature, and therefore at high pressure. The gas expands, and expends its energy on the movable object which is pushed in front of it. The purpose in both cases is to obtain the complete expansion of the hot gases, to reduce the loss of pressure and heat to a minimum, and lastly to allow the gases to escape into the air at not too high a temperature, at a pressure little above that outside and at a negligible velocity. The methods of operation and the theory to be applied are identical.

It follows therefore that the gun and the explosive motor are the results of the same researches, and their progress is due to the same victories of science. It seems therefore useful to observe why the gun has become the wonderful machine of war that every one knows, while the gunpowder motor has made no progress.

The explosive gas motor, which is a mild form of explosive engine, is the only one that has so far made any headway. Its successes have placed it in the forefront of industrial thermal engines. And indeed it is the motor which makes the best use of the available heat, and transforms the largest proportion thereof into work. The steam engine has been far surpassed by it.

The best steam engines known consume 3,000 calories per indicated horse-power hour, or 3,300 per effective horse-power hour. On the other hand gas motors consume from 2,300 to 2,500 calories per horse-power hour. It may in fact be said that the gas motor has an efficiency of 30, while the best steam engine scarcely reaches 19.

The engineer Aimé Witz has carried out some interesting research with the idea of illustrating the theory of gas motors by

measuring the results given in the latest patterns of guns. He shows what progress it may be hoped to make with gas motors.

The efficiency of a gun (and similarly of a motor) is measured by the relation between the heat transformed into energy, and the heat available from the charge. To calculate the result it is necessary to know, on the one side, the mass m of the projectile, and the velocity v at the mouth of the bore; and on the other side the weight w of the charge, and the number Q of calories given out by the complete combustion of one kilogramme of the explosive.

Take A as the calorific equivalent of the work, which is equal to $\frac{1}{425}$, we get—

$$x = \frac{A \frac{1}{2} m v^2}{w Q}$$

The value of x for a Krupp gun of 30.5 cm., with a 408 kg. projectile, and an initial velocity of 696.5 m using a charge of 66.85 kg. of smokeless powder is .44. For the majority of modern guns the figure is .36.

The efficiency of a gun is therefore superior to that of an explosive motor, which in its turn is higher than that of a steam engine.

From this incontrovertible fact the engineer Witz endeavours to draw conclusions with the object of improving the gas motor.

He analyses the operations performed by guns as follows:—

Modern powders are characterised by their power and slowness of action, that is, they burn slowly and produce great energy very gradually, so that the gun is not subjected to undue strains. The velocity of recoil and the power of the effects may be altered at will by modifying the shape and composition of the powder.

A suitable description of powder has been manufactured for each kind of gun or rifle. The burning of the charge, which follows the sensitiveness of the explosive ensures complete combustion, and the copper driving band on the projectile, which is pressed into the rifling of the bore provides a far more effective sealing arrangement than the piston in a cylinder, however well fitted. The gases developed in the chamber by the explosion are compressed at about 400 kg., and attain eventually an explosive pressure of 4,500 kg. The corresponding temperatures are very high.

In the French model 1886 rifle the 80 cm. bore is more than 110 calibres in length. The latest guns are at least 35 calibres, and have been manufactured up to 60 calibres in the bore. The temperature and pressure of the gases is much reduced by the longer time in which they expand, and consequently the effective work is increased, the loss being smaller.

Generally speaking the results show the perfection of that heat engine, the modern fire-arm.

It may be remarked also that considering the gun purely from the mechanical standpoint, Mr. Longridge found that the sum total of the losses due to the energy of recoil, the rotation of the

projectile, the engraving of the driving band, etc., do not exceed 4 per cent, which gives a mechanical efficiency of 96 per cent.

But the experimental theory of motors receives a valuable contribution from the comparison with the gun. Let us consider the influence that the walls of the cylinder has on the efficiency of the motor. By experiments in a laboratory, made with a cylinder containing a piston actuated by the products of an explosive mixture, Witz has shown that the cooling of the gases in contact with a wall more or less hot tends to modify the action of combustion, and expansion, in the sense that by diminishing the cooling effect the efficiency is sensibly increased. The heat taken out of the walls cooled by means of the water, which circulates in the chamber outside the cylinder, is evidently lost. Therefore the walls should be heated to as high a temperature as possible, and the combustion and explosion should be effected in the minimum space of time.

Now this conforms in a most unexpected manner to the theory of the gun.

In fact the use of Colonel Younghusband's measuring instruments shows that the period of the trajectory of a projectile spent in the bore of a gun extends to only a few thousandths of a second. The interval, during which the heat can be conveyed from the hot gases to the metallic container, is therefore very small, and consequently the importance of this loss is much reduced. Indeed while General St. Robert found that the loss from this cause in long guns is only 3 to 4 per cent, Messrs. Noble and Abel found on the other hand that in gas motors the loss from the same cause is from 30 to 35 per cent. Thus the theory is confirmed that the greater efficiency of the gun is due to the small harmful effect exercised by the walls of the bore.

The deductions drawn from the comparison between guns and motors are all in favour of high pressures, elevated temperatures, ample expansion and movements at great velocity. Necessity limits the application of these laws in motors. Therefore the efficiency of powerful explosive motors seldom exceeds that of the smaller motors, though the contrary might be anticipated. To sum up, according to our author, manufacturers will make a great mistake in losing sight of the advantages to be gained by reducing the action of the walls.

To confirm his conclusions he quotes the following instance:— In 1867 Messrs. Langer and Otto constructed a small motor, consisting of a semi-atmospheric engine, in which a free piston was actuated by the explosion of a detonating mixture, and on its return stroke engaged the motor shaft. The cylinder was not entirely cooled, and the water circulation only extracted 6 per cent of the heat of the gases. Well, this imperfect motor gave an effective horsepower hour, with a consumption of only 740 litres of illuminating gas. This result has not been surpassed. Witz considers the deduction obvious. This engine was really a motor gun, in which the action of the walls was reduced to a minimum.

[*Rivista d'Artiglieria e Genio*, June 1907.]

The German General Staff on the Siege of Port Arthur.

The German General Staff is publishing a series of articles on non-European wars, which began with the South African campaign. These monographs are not intended to be complete histories, but rather sketches of the more instructive episodes in the wars. Among these, the articles on the great war in the Far East naturally find a prominent place. They begin with the siege of Port Arthur, as embodying some of the most interesting questions which arose during the campaign.

The Italian reviewer of the German monograph, from whose excellent article this précis is taken, recommends every one to study the original. The facts are set forth in a methodical manner, and in places where the text is apt to be dry the attention of the reader is held by well considered comments and reflections on the situation. The *Militär Wochenblatt* explains that the main value of the monograph lies in this, that it expresses the ideas and opinions of the General Staff on a matter, which has received but little attention, *viz.*, siege warfare. The appreciation of the situation and the eventualities is assisted by such excellent maps and sketches that a student of war will find an inexhaustible store of material, no matter to what particular arm he may belong. Briefly the monograph is as follows:—

CHAPTER 1.—A rapid historical survey of the creation and development of the fortress; a summary of the Russian plans for its strengthening and a glance at the actual condition of the works when war broke out, showing clearly, like many other inexplicable facts, that the Russians never really believed that the Japanese would have recourse to the arbitrament of war. Otherwise the forts would have been in a very different state. Every time the Russians have looked upon a situation as serious, they have had no difficulty in providing the funds to place their house in order, nor have they been hampered by considerations of the delicate susceptibilities of other States.

CHAPTER 2.—A short and clear description of the terrain round the fortress.

CHAPTER 3.—Details about the Russian forces and fleet.

CHAPTER 4.—The condition of the fortress at the commencement of hostilities, the various works, etc., and their armament.

CHAPTER 5.—The arrangements made by the III Japanese Army, which was charged with the duty of besieging the fortress.

CHAPTER 6.—The Japanese operations against Port Arthur before the investment.

CHAPTER 7.—The communications on the flanks of the besieging army, with a survey of the secrecy with which they were made altered or increased as occasion demanded.

CHAPTER 8.—The choice of the front to be attacked.

CHAPTER 9.—The development of the siege.

CHAPTER 10.—This contains the verdict, and is of marked interest so that its reproduction here, as far as space permits, needs no apology.

The means of attack at the start were too weak. The besieging army at the beginning was but slightly stronger than the defence in *infantry*, and though the superiority gradually increased, it was not until the arrival of the 7th Division, in November, that it became sufficient. The case of the besieging *artillery* was even worse. It was inferior in the number of guns and in their calibre, and it was not till October that a few guns arrived, which could be expected to produce some effect on the fortifications. It is true that the Russian artillery was also weak, being mostly of antiquated pattern. But this was not so great a handicap as the weakness of the attacking guns, when it is remembered that the latter had to deal, not only with the defending artillery, but also with the infantry and the forts.

In a criticism of the fighting, the fact of the insufficiency of the means for the frontal attack on the naturally powerful positions must always be borne in mind. Consequently great circumspection must be exercised in drawing conclusions.

The operations round Port Arthur do not give a clear reply to the question whether the attack of terrain not immediately adjoining a fortress should be opposed. In the extraordinarily favourable conditions of the Kuan Tung Peninsula the possession of the outer terrain could not have been entirely neglected by a really energetic defender, more especially as it was necessary to gain time, in order to complete or at least push forward the progress of the fortifications.

There is no doubt that the Russians could have done more at Kin Shu. The last battles of June and July show that the occupation of extensive positions, which cannot be supported by the guns of the fortress, will not ensure holding the outer terrain.

The Russians only maintained their positions till the end of July because the Japanese were not yet strong enough to attack the fortress. More active methods would have given the Russians good chances of success.

The occupation of advanced positions for the artillery of a fortress was shown to be of advantage. The advanced positions at Taku-Shan, and on the north-east and north-west fronts cost the Japanese much loss of life and time, and even necessitated a partial siege; though how far the weakness of the Japanese means of attack contributed to this, it cannot be said.

The Japanese attempt, in August, to take the fortress by assault failed, and it is not surprising. The conditions of success were wanting, such as an incapacity of the works to resist assault, demoralised and weakened defence, and powerful preparation by the attacking artillery. Still the defender's position must have been something like critical when the Japanese, having captured Nos. 1

and 2 redoubts, pushed the assault up to the Chinese wall. Had the attack been stronger, the circle of defence would probably have been penetrated at one or two points.

The regular siege was slow by reason of the attacker's weakness. This weakness explains why the besiegers and besieged were almost hand to hand for weeks, without the former obtaining the superiority; and also why, in these days of scientific war matériel, ancient devices, such as hand grenades, were used with advantage on both sides.

The siege of Port Arthur is a convincing proof that to attack a fortress with insufficient artillery must necessarily result in numerous failures and serious losses. The Japanese artillery made no impression on the concrete bomb-proofs excavated in the rocky soil. It cannot be safely said that numerous guns of a modern type would have done any better. But certainly large calibres, and a heavy expenditure of ammunition would have been required. Where, as at Port Arthur, artillery fails to produce any effect on casemates, this duty as heretofore falls to the engineer services. The same applies to bomb-proof shelters for troops. At Port Arthur the Russian power of resistance after the caponiers had been destroyed was due to the fact that the garrison was invariably kept in bomb-proof cover until required to repel an assault.

The employment of the Japanese artillery was not in accordance with modern accepted principles. At first no attempt was made to obtain the superiority over the enemy's artillery. Instead fire was distributed between the harbour, the city and the enemy's positions. So also before an assault fire was directed chiefly on the point of attack, without paying sufficient attention to the strength of the enemy's fire from neighbouring works. In consequence the heaviest Japanese losses were due to flanking fire. Later on an attempt was made to overwhelm the Russian guns, but this did not succeed entirely, perhaps through difficulties in the ammunition supply.

The grouping of the defence works in accordance with the depth of the position was a success. The terrain was suitable, and as a rule every advanced work was supported by those further back. Thus enveloping movements were impossible, and the difficult frontal attack was the only course open to the Japanese. In consequence, also, even when an advanced work had been taken, fresh attacks were necessary for the works further on, etc.

The use of machine guns formed a notable addition to the strength of the defence. They are easily moved about and brought into position, offer a small target, are difficult to see and have excellent effect against assault.

Of necessary defences, the simple wire entanglement has shown itself the most useful. Passing an electric current through the wire, and other experiments proved to be of small value.

There was no veritable subterranean warfare, as formerly understood. Mines were only resorted to when the Japanese had reached the glacis of a fort and taken it, in order to destroy casemates. The

possibility or otherwise of an attack by mine after the ancient fashion is a point on which Port Arthur throws no light.

Surprise has been expressed at the Japanese procedure of mining under the very outworks of the forts. But there is in fact no ground for the surprise. The assaults made after the destruction of the caponiers were repulsed with heavy loss. The Japanese guns were not powerful enough to operate against the enemy's excellent cover. Mines were the only resource. And here indeed there came the real subterranean warfare. The Russians answered mine with countermine, though in the result the progress of the Japanese was not greatly impeded. But this sort of thing would not be necessary if the attacking artillery were up to standard, and the infantry as numerous as they should be.

The positions from which the assaulting parties set out were far nearer to the enemy than had been considered practicable, the actual distances running from 100 *mètres* down to as little as 30. At the same time the point of attack was invariably the object of the heaviest artillery fire that could be brought to bear. Yet no inconvenience was experienced. It is, however, open to question whether such tactics would be possible with high explosive shell.

The Russians made no attempt at sorties on a large scale, although the nature of the ground and the Japanese weakness offered the most favourable conditions. Minor sorties were frequently attended with success.

The siege of Port Arthur was a necessity. The Japanese could only prosecute their operations on land on the condition that they had complete command of the sea. Therefore it was necessary to destroy the Russian Far Eastern fleet, and as this fleet would have found a secure haven in Port Arthur, an attack on that fortress from the land became a matter of necessity, even though it was so far removed from the theatre of operations.

The wisdom of the decision to undertake the siege of Port Arthur was at once apparent when the Russian Baltic fleet began to approach the waters of the Far East.

REVIEW.

WELLINGTON'S CAMPAIGNS.*

**Peninsula—Waterloo; also Moore's Campaign of Corunna
(for Military Students).**

BY MAJOR-GENERAL C. W. ROBINSON, C. B. (LATE RIFLE BRIGADE).
WITH SKETCH-MAPS AND PLANS.

The author has brought together in this single volume his accounts of the campaigns, which he has previously published in three parts, having thoroughly revised the text, maps, and plans of the latter.

Wellington's Campaigns must always form an invaluable study to British officers, illustrating as they do the manifold difficulties, which beset a Commander-in-Chief in the field under the British Constitution, and the many heart-burnings and jealousies which arise when acting in concert with Allies—all of which must repeat themselves when the British Army again takes the field on the continent of Europe in the perhaps not very far distant future. The inestimable value of the command of the sea, and the necessity of intimate co-operation between the two Services are subjects which can never be harped upon too much or too often, and the author points out what weight Wellington attached to them.

The topography of the theatre of war is ably described, and emphasis laid on its influence on many of the operations.

Without entering into any great detail, all the chief events of the campaigns are included in a careful account, and really valuable comments are added after each particular campaign or battle.

The author would seem to have missed a point in not laying more stress on Napoleon's masterly strategic concentration for the Waterloo Campaign—a model for all time,—but with this exception the lessons of the campaign are brought out, and the mass of information available well sifted.

The book is well got up, the maps and plans are clear (which is certainly not the case in a recent work on the Peninsular War) and there is a useful index.

It is a work that all military libraries should possess.

* London: Hugh Rees, Ltd., 119, Pall Mall, S.W., 1907. Price, 8s. 6d. net.

WATERLOO.*

BY THE LATE CAPTAIN J. W. E. DONALDSON, R.F.A., P.S.C.,
AND CAPTAIN A. F. BECKE, LATE R.F.A.

WITH ONE MAP AND TWO PLANS.

This little book is really a reprint of Chapter 5 of the 2nd edition of "Military History applied to Modern Warfare" by the same two authors.

It is merely intended to supplement other and larger works and for detailed composition of the various armies the reader must turn to Ropes, Siborne, etc.

It does, however, present the events of the short campaign in a concise manner, and sets forth clearly the lessons to be learnt.

There is a good discussion of the courses and lines of advance open to Napoleon, though the difficulty of the Ardennes country as an objection to the eastern line is not mentioned.

The homogeneity of the French and Prussian armies as contrasted with the heterogeneous collection under Wellington is well brought out.

The qualities required of a commander and of a chief of the staff are very different, and though Soult was a leader of men he was not a "Berthier"; once more we are shown by his mistakes and those of his subordinates that a competent staff cannot be improvised, and that "faulty staff work will mar the most brilliant conceptions."

Ziethen's well-known handling of his troops on June 15th is described, and—a point sometimes missed—his singular omission in allowing the bridges over the R. Sambre to fall into the hands of the French without attempting to destroy them.

The preliminary dispositions and subsequent concentration too far forward of Wellington and Blücher are ably criticised, and their good fortune in not suffering on this account owing to Napoleon's unusual lack of energy is emphasised.

The strategical and tactical lessons deduced and the causes of Napoleon's ultimate defeat are well and clearly put at the end of the book.

As regards the plan of the Theatre of Operations it would be an improvement if the scattered dispositions of Wellington and Blücher were placed on it, say on June 14th, as also the positions of the various French Corps on that date.

* London : Hugh Rees, Ltd., 119, Pall Mall, S.W., 1907. Price, 2s. 6d. net.

THE SEMAPHORE ALPHABET MADE EASY.*

BY CAPTAIN H. R. VON D. HARDINGE, I.A.

The Semaphore chart with the above title is folded up in handy pamphlet form, and contains complete instructions, fully illustrated of the art of Semaphore signalling either with flags or with the mechanical Semaphore. Any officer desiring proficiency in the art cannot do better than study this chart, and follow the simple method of instruction laid down. An hour a day for one week should be quite sufficient to make him thoroughly acquainted with this system of signalling. Practice will do the rest.

QUESTIONS ON THE WATERLOO CAMPAIGN.†

BY LIEUT.-COLONEL H. M. E. BRUNKER.

This pamphlet, published by Forster, Groom and Co., should prove extremely useful to officers going up for their promotion examinations. The questions are well thought out and practically cover the whole ground contained in the standard works on the campaign in question. No answers are given to the questions, and this is all to the advantage of the student, for by reading up the Standard works on the Campaign, he will obtain a far wider and more thorough grasp of the subject than by committing a series of cut and dried answers to memory. The questions are merely intended to help the student in testing his knowledge of the subject; but in order to assist him, where there may be any difficulty in finding the proper answer to a question, the page of the text-book required for reference is mentioned. Some valuable hints are also given in the Preface as to the points to be considered when criticising any of the events in the Waterloo Campaign.

MORAL or MORALE.

BY THE ADJUDICATING OFFICER OF THE TACTICAL SCHEME
COMPETITION OF JULY, 1906.

In the criticism of the Tactical Scheme Competition for July, 1906, I made the following remarks:—"Many competitors spelt the French word *moral* wrong. So spelt without an *e* it means *spirit*, the courage and discipline of an army; with the *e* as *morale*, it means *morals*, such as chastity, honour, or other virtues."

* Forster, Groom, Ltd. Price, 6d.

† Forster, Groom, Ltd. Price, 1s.

This statement has been called in question. One correspondent writes as follows:—"May I be allowed to offer a correction? The English word 'morale'—which is indeed a corruption of the French word '*moral*'—is correctly used by those competitors, who wrote it as above, and not as stated by the Adjudicating Officer. This word is to be found in Dictionaries of the English language and means the mental condition of the soldier and others as regards his courage, hope, zeal, etc."

I have examined several authorities. The only one I can find in support of this correspondent is a book published at the Clarendon Press, Oxford, in 1906, called "The King's English." In this book occurs the following passage: "The French for what we call *morale*, writing it in italics under the impression that it is French, is actually *moral*. The other is so familiar, however, that it is doubtful whether it would not be better to drop the italics, keep the *e*, and tell the French that they can spell their word as they please and we shall do the like with ours." This is a truly insular English view, the adoption of which I leave to those to whom it appeals.

In support of my contention that a French word should be spelt as the French spell it, especially when by the addition of the *e* it is given a totally different meaning in French, besides the vivid recollection of the scorn of my old French master of what he considered the 'English habit' of stealing a foreign word and by misspelling destroying its original meaning, as well as the memory of many corrections on this point given by the professors of the Staff College, I have the following authorities:—

From "Bellows' Pocket Dictionary":—

"**MORAL** spirits (*pl.*) mind: intellect. (The English generally misspell this word in speaking of the '*morale*' of an army for its courage and discipline)."

From the "Imperial Dictionary of the English Language":—

"**MORALE** (mo'-räl) *n.* (An erroneous spelling of the French *moral*, which is used in same sense.) Moral or mental condition as regards courage, zeal, hope, etc."

There are many other English dictionaries, which give corruptions and other vulgarisms, but to quote from these is only to emphasise the fact that '*morale*' is an error, a misspelling of a French word, the use of which is to be deprecated by educated people.

and 2 redoubts, pushed the assault up to the Chinese wall. Had the attack been stronger, the circle of defence would probably have been penetrated at one or two points.

The regular siege was slow by reason of the attacker's weakness. This weakness explains why the besiegers and besieged were at close hand to hand for weeks, without the former obtaining the superiority, and also why, in these days of scientific war, many of the ancient devices, such as hand grenades, were used with advantage on both sides.

The siege of Port Arthur is a convincing proof that to attack a fortress with insufficient artillery must necessarily result in numerous failures and serious losses. The Japanese artillery made no impression on the concrete bomb-proofs excavated in the rocky soil. It cannot be safely said that numerous guns of a modern type would have done any better. But certainly large centres of heavy expenditure of ammunition would have been required. Where, as at Port Arthur, artillery has to produce any effect in casemates, this duty as heretofore falls to the engineer services. The same applies to bomb-proof shelters for troops. At Port Arthur the Russian power of resistance after the casemates had been destroyed was due to the fact that the garrison was invariably kept in bomb-proof cover until required to repel an assault.

The employment of the Japanese artillery was not in accordance with modern accepted principles. At first no attempt was made to obtain the superiority over the enemy's artillery. Instead fire was distributed between the harbour, the city and the enemy's positions. So, also, before an assault, fire was directed chiefly on the point of attack without paying sufficient attention to the strength of the enemy's fire from neighbouring works. In consequence the heaviest Japanese losses were due to plunging fire. Later on an attack was made to overwhelm the Russian guns, but this did not succeed entirely, perhaps through difficulties in the ammunition supply.

The grouping of the defence works in accordance with the depth of the position was a success. The terrain was so favourable, as a rule, every advanced work was supported by those further back. This enveloping movement was impossible, and the only method of attack was the only course open to the Japanese. In cases where it was also even when an advanced work had been taken, fresh attacks were necessary for the works further on, etc.

The use of machine-guns formed a notable addition to the strength of the defence. They were everywhere about and brought into position either as supporting fire or direct to sea and to the execution of the assault.

Of necessity details of the siege were entering port, but have not been stated. Landing and disembarking the light troops and other experts proved to be a task of some value.

There was no over-estimation of the weather as far as the sea was concerned. Mines were everywhere laid, when the Japanese had possession of the gables of a fort and took it in order to destroy casemates, etc.

possibility or otherwise of an attack by mine after the ancient fashion is a point on which Port Arthur throws no light.

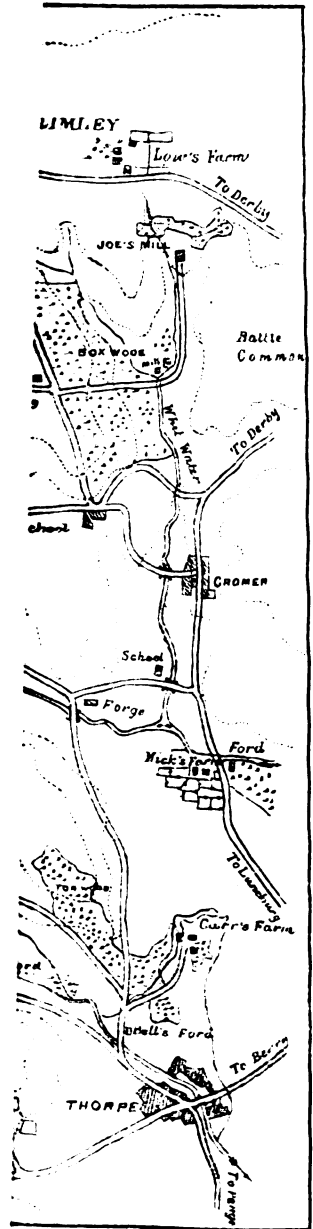
Surprise has been expressed at the Japanese procedure of mining under the very outworks of the forts. But there is in fact no ground for the surprise. The assaults made after the destruction of the caponiers were repulsed with heavy loss. The Japanese guns were not powerful enough to operate against the enemy's excellent cover. Mines were the only resource. And here indeed there came the real subterranean warfare. The Russians answered mine with countermine, though in the result the progress of the Japanese was not greatly impeded. But this sort of thing would not be necessary if the attacking artillery were up to standard, and the infantry as numerous as they should be.

The positions from which the assaulting parties set out were far nearer to the enemy than had been considered practicable, the actual distances running from 100 *mètres* down to as little as 30. At the same time the point of attack was invariably the object of the heaviest artillery fire that could be brought to bear. Yet no inconvenience was experienced. It is, however, open to question whether such tactics would be possible with high explosive shell.

The Russians made no attempt at sorties on a large scale, although the nature of the ground and the Japanese weakness offered the most favourable conditions. Minor sorties were frequently attended with success.

The siege of Port Arthur was a necessity. The Japanese could only prosecute their operations on land on the condition that they had complete command of the sea. Therefore it was necessary to destroy the Russian Far Eastern fleet, and as this fleet would have found a secure haven in Port Arthur, an attack on that fortress from the land became a matter of necessity, even though it was so far removed from the theatre of operations.

The wisdom of the decision to undertake the siege of Port Arthur was at once apparent when the Russian Baltic fleet began to approach the waters of the Far East.



TACTICAL SCHEME COMPETITION, APRIL 1907.

WINNING SOLUTION.

BY "PRO UTILITATE," MAJOR E. TENNANT, 20TH DECCAN HORSE,
REGISTRATION OFFICER.

GENERAL IDEA.

1. The road from LISS to DERBY *via* GARTH'S CROSS-STOKE-RONDAL forms the line of communication of a Red Army which is operating to the east of the map.

2. The country is hostile to Red and formed bodies of hostile (Blue) troops are known to be to the south and south-east.

3. A Red convoy, consisting of a siege train, ammunition and other valuable stores, escorted by a Brigade of all arms, is moving up the line of communications to join the Red Army.

SPECIAL IDEA.

4. On the afternoon of June 1st this convoy has halted for the night at a Post X, 2 miles west of BORTON.

2 Squadrons Cavalry.

25 Cyclists.

1 Section R. F. A.

1 Battalion Infantry
(with 2nd line transport).

5. The advanced guard of the convoy, strength as per margin, which is under your command, has halted for the night near DUNSTAN HALL.

6. At 5 P.M. on June 1st you receive the following instructions from the G. O. C. convoy :—

"Post X., 4-30 P.M., 1-6-07.—The convoy will march at 6 A.M. to-morrow *via* GARTH'S CROSS-STOKE-RONDAL-CROMER to Post Y (4 miles north-east of CROMER).

I have reliable information that the country to the East is clear of hostile troops, but that a Blue force, estimated at 1,800 mounted men with 4 guns, arrived to-day at BANSTEAD (24 miles south of ALTON). The force under your command will protect the right flank of the convoy during its march to-morrow, within the limits of the map. When the rear of the convoy has cleared CROMER your force will follow to Post Y, acting as Rear Guard.

A new advanced guard for the convoy, strength 1 Troop Cavalry and 2 Companies Infantry, has been detailed and marches at 5-40 A.M. to-morrow.

Reports for G. O. C., convoy, during to-morrow's march, to be sent to the head of the main body of the convoy escort."

7. The convoy column, including its escort, occupies 4 miles of road and moves at 3 miles an hour.

8. Your patrols, at 3 P.M. on the 1st, reported all clear up to a line from 5 miles south of ALTON to CROMER.

9. Your force, during the night of 1st-2nd June, has 2 Companies Infantry on outposts.

10. *Required* :—

(a) An appreciation of the situation and the action you propose to take to carry out your instructions.

(b) The orders you issue on the evening of June 1st.

APPRECIATION.

Bodies of hostile troops (strength and composition unknown) are reported to be towards the S. and S.-E. including a mounted force of 1800, men and 4 guns in the neighbourhood of BANSTEAD.

To the E. all is clear. Regarding the N. nothing is stated.

The country is hostile therefore little or no information will be obtainable from the inhabitants. The Blue force is so vastly superior that its commander will have no difficulty in detaching 3 or 4 squadrons to oppose my 2 in order to prevent them from discovering the line of advance of the bulk of his troops. I must therefore be prepared to meet an attack in any direction with little or no warning.

The length of front which the flank guard has to cover is represented by the length of the convoy, *viz.*, 4 miles.

The information given regarding "our own troops" is rather vague, *viz.*, "a convoy, consisting of a siege train, ammunition and other valuable stores, escorted by a brigade of all arms." Nothing official seems to be laid down as to the composition of a siege train—(in the current number of the R. A. Journal it is estimated at 184 pieces, consisting of 8" and 6" siege guns and "heavy" and "medium" howitzers, with some 3,000 gunners), but whatever its actual strength the presence of heavy guns with the convoy is an important factor in the solution of the problem.

"A brigade of all arms" is also somewhat indefinite but may be assumed to consist of—

4 battalions infantry.

1 regiment cavalry.

1 battery F. A.

Under these circumstances it is a fair deduction that the duty of my flank guard will be—

(a) to guard against surprise,

(b) to hold the enemy in check long enough to enable the G.O.C. to make the necessary dispositions.

But that it is not expected to be able to hold its own, without support, until the main body and convoy have passed.

In considering the measures to be taken it must be borne in mind that the enemy's strength (*i.e.*, of the only force of which I have definite information) lies in his mobility and his weakness in the fact that for dismounted action a large proportion of his force will be

used up as horse-holders and mounted escort, and, in addition, his dismounted troops being unprovided with bayonets, will rely mainly on outflanking movements to capture defended positions, so that a very few rifles lining the edges of woods or behind entrenchments will be sufficient to stop any direct advance against them. On the other hand particular care will have to be taken to prevent the flanks from being turned.

The enemy may, however, retain his troops mounted and endeavour to gallop through or past the flank guard and get in at the convoy. The most favourable localities for carrying out this plan are—

(a) across the open ground W. of the river YARE, south of DUNSTAN HALL, and

(b) from the direction of THORPE towards STOKE.

The head of the convoy column will arrive at the cross-roads (1 mile S. of LORNE PARK) about 6-20 A.M. and its rear guard will not be clear of this spot until 7-40 A.M., so that during this period I must be prepared to protect the right flank of the convoy for the whole distance between RONDAL and the W. edge of the map. Furthermore, it must be noted that a hostile column, having previously driven in my mounted troops could concentrate unobserved near THORPE and then rapidly advance by any of the following routes, all of which are concealed until one reaches the heads or sides of the valleys in which they lie:—

(a) *via* HOLLOW FARM-LYE FARM-COX'S FARM to MAHARAMBOUT WOOD and THE MOUNT;

(b) *via* PAT MILL-HALL FARM to LONG HILL and MAHARAMBOUT WOOD;

(c) through TOR WOOD and along the eastern slope of LONG HILL.

An advance either by way of (a) or (b) would be blocked by a force holding the line KEEPER'S LODGE-BEECH WOOD-MAHARAMBOUT WOOD—DICK'S FARM.

The river YARE affords the convoy a certain amount of protection from an advance by way of (c), and a detachment posted in TOR WOOD would be such a threat to the enemy's flank and rear that he would be compelled to capture the wood and LONG HILL spur before advancing by this route. This would at once betray his presence.

I assume my outpost line to include GARTH'S CROSS, FORGE, and THE PLOUGH and (although no mention is made of the fact in the problem) that, bearing in mind that it is an enemy's country and that attack may come from any quarter, I have employed my 25 cyclists, under the orders of the O.C. the outposts, as standing patrols and that they are posted near the following points:—

1. THE GREEN.
2. N. exit from ALTON.
3. KEEPER'S LODGE.

4. DOD'S FARM.
5. BULL INN.
6. TILFORD.

My cavalry have been out reconnoitring all day, probably also on the previous days, and they will be required very early the following morning, therefore I decide to give them all the rest I can. It is absolutely necessary, however, that I should get some more definite information regarding the enemy and also that I should get it before morning. I therefore send for my O. C. Cavalry and order him to despatch, as soon as it is dusk, two "Contact troops"—one in the direction of BANSTEAD and the other towards PENGE, to get into touch with the enemy's mounted column and keep me informed of his movements.

Whole troops are considered necessary as it is impossible to say how long they may be away, and the transmission of information by despatch riders consumes a great number of men who cannot be replaced. Reports to be sent to DUNSTAN HALL till 6 A.M. the following morning and then to FORGE.

The remainder of the cavalry will return to the bivouac at dusk by which time the outposts will be posted.

As I cannot rely on my cavalry being able to give me either early or detailed information regarding the enemy's movements, I must make arrangements for occupying the more important tactical positions beforehand, even though it necessitates a dispersion of my troops.

The latest information received on the afternoon of the 1st June was that no hostile troops were within 5 miles of the ALTON-CROMER line at 3 P.M. Between 3 P.M. and the following morning the situation may be entirely altered, hence it is useless to issue detailed orders for the morrow which may very possibly have to be cancelled or modified during the night.

Accordingly on the eve of the 1st June I merely issue "Assembly Orders" for the following morning, but in order to make my solution of the problem perfectly clear, I append a draft of the arrangements I propose to make on the following day if no further news come to hand in the meantime compelling me to alter them.

BIVOUAC NR. DUNSTAN HALL,
1st June 1907.

OPERATION ORDERS.

No. 23 by Colonel X, Commanding Right Flank Guard (late Advance Guard).

The map referred to is marked "Map C."

1. Hostile troops are reported to be towards the S. and S.-E. including a column, estimated at 1,800 mounted men and 4 guns,

which arrived at BANSTEAD to-day. According to reliable information the country to the east is at present clear of hostile troops.

The convoy will continue the march to DERBY to-morrow morning at 6 A.M. from POST X, *via* the LISS-GARTH'S CROSS-STOKE road.

2. The detachment will form the right flank guard to the convoy during its march to-morrow: a new advanced guard being detailed from the main body.

3. The detachment, with the exception of the outposts, will be formed up at 4-30 A.M. to-morrow, ready to march off, just north of THE ANGEL and west of the river YARE.

4. The 2nd line transport, in charge of 1 N.-C. O. and 3 men to be detailed by the O. C. 1st Battalion, will remain at the bivouac. It will be formed up in column of route at 7-30 A.M. and fall in at the rear of the convoy column.

5. Reports to be sent to the bivouac.

E. T., MAJOR,
Staff Officer.

Issued at 5-30 P.M.

Dictated to representatives of the following units:—

1st Cavalry.

1st Infantry.

1st Battery R.A.

One copy to O. C. Outposts.

Ditto G.O.C. Convoy Column.

Proposed arrangements to be made at daybreak on the morning of the 2nd June, provided the situation is not materially changed during the night.

1. The detachment to take up a defensive position extending from THE GREEN to DICK'S FARM.

2. *Cavalry*.—One squadron to watch the front up to 5 miles south of the line THE GREEN-THORPE.

Two troops to at once occupy the S. edge of TOR WOOD.

Attention of O. C. Cavalry to be specially directed to the approaches to THORPE and THE GREEN.

3. *Artillery*.—The guns to take up a position of readiness near THE GREEN and to come into action immediately upon the approach of hostile troops.

4. *Infantry*.—*Two companies* to occupy No. 1 section, extending from the W. edge of the map, through THE GREEN and BISLEY WOOD to the river YARE (both inclusive).

One company to occupy No. 2 section, extending from the river YARE (not inclusive) along the S. edge of GLEN WOOD to KEEPER'S LODGE (inclusive).

Two companies to occupy No. 3 section, extending from KEEPER'S LODGE (not inclusive) through BEECH WOOD to the S. E. corner of MAHARAMBOUT WOOD (not inclusive).

One company to occupy No. 4 section, extending from the S. E. corner of MAHARAMBOUT WOOD to DICK'S FARM (both inclusive).

5. *Outposts*—*The infantry* of the outposts to concentrate at the FORGE where they will form the *general reserve*.

The cyclist standing patrols at THE GREEN, ALTON, KEEPER'S LODGE, and DOD'S FARM to stand fast till the arrival of the troops detailed to defend the sections in which their respective posts lie, they will then come under the orders of the O. C. the section.

The remainder of the cyclists to concentrate at the FORGE to act as despatch riders to the O. C. Flank Guard.

6. Communication to be maintained between all portions of the force, as far as possible by signalling.

7. Reports to be sent to the FORGE.

These arrangements would hold good up to 7-40 A.M.

Between 7-40 A.M. and 9-30 A.M. (after which the convoy should be clear of CROMER) the front to be guarded may be said to extend from the river YARE (near ALTON) to the E. edge of the map.

In order to do this I propose to move the guns from THE GREEN into a position of readiness on the road near DOD'S FARM; the company of infantry from No. 4 section, reinforced by the 2 companies in reserve at FORGE, into a position of readiness in rear of the crests of LONE HILL and LAMB'S FARM spur.

The 2 companies from No. 1 section to move up to LARRY and form the reserve.

The cyclists (less those required by the O. C. as orderlies) to concentrate at DOD'S FARM and form the escort to the guns, in order to give the latter more mobility.

The squadron cavalry, if driven in, to fall back on TOR WOOD and reinforce the two troops already there.

REMARKS BY ADJUDICATING OFFICER.

Sixteen solutions of the scheme were submitted and it was not easy to adjudicate the best as several solutions were of nearly equal merit with the one by "PRO UTILITATE"; among them may be mentioned those by "VIRTUS SUB PONDERE CRESCIT," "TEMPUS EDAX RERUM" and "UT INFRA." The winner however is considered to have, generally, best fulfilled the necessary conditions, though there are points, either omitted, or open to criticism in his solution, which were recognised and dealt with by one or other of the three competitors above mentioned.

The task before the Commander of the Red detachment involved dealing with a very mobile opponent, about whose movements little was known and who, having the initiative, could choose where to strike. Early information regarding the Blue mounted force at BANSTEAD was therefore of first importance in order that the Red Commander might possess some indication where to be best prepared to meet his enemy along the extended front which it was his duty to protect—Combined Training, section 152 (3), 153 (3).

Most competitors recognised the importance of this, but few took any steps towards it, and among these few the greater number relied either on their outpost standing patrols or on patrols which were not

sent out till the morning of June 2nd. Both these means were insufficient; the business of standing patrols is "protective" not "tactical reconnaissance"—(Cavalry Training, pages 174—176 and Combined Training, section 96). The two duties are distinct and separate and to get information of the enemy special patrols should have been sent out at once with orders from the Red Commander to seek out the enemy (not to take any locality as their objective—Cavalry Training, page 199 (c)), to keep touch with him and to report his movements. The morning of the 2nd was too late to despatch patrols, it being quite possible that the enemy might have advanced on the afternoon of the 1st or during the night of the 1st-2nd. Cyclists are suitable to employ for reconnaissance at night in such country and the winner might have used some in conjunction with his "contact troops" instead of employing them all as standing patrols.

The line THE GREEN, N.-E. corner of EPSOM DOWNS or LONE HILL, was generally recognised as being the one which it would be necessary to deny to the enemy in order to ensure the safe march of the convoy, and the method adopted by most competitors of securing this line by means of detachments holding the most important tactical points, with a reserve to move wherever required, seems a suitable one and is also well adapted for the subsequent retirement as a Rear Guard—(Combined Training, section 61 (3) and (4)). It would seem best, however, having in view the mobility of the enemy for the Red Commander, to have made sure of forestalling the enemy on this line and to have moved, at least towards it, on the evening of the 1st. The convoy at Post X would have its own outpost protection and there is no reason why the Red detachment should remain near DUNSTAN HALL which is inconveniently far from the line which must be denied to the enemy. The days in June are long and the furthest point to be held is not more than 1½ hours' march from DUNSTAN HALL, the men would not therefore be put to any real discomfort by moving, say, at 6-30 P.M., and the extra security obtained against any rapid move on the enemy's part would be considerable. Two of the solutions arranged for such a move; but one took, practically, his whole force to LONE HILL and left the western portion of his front, the one on the enemy's most direct line of advance from BANSTEAD, entirely unprotected; this was not sound.

The winning solution makes a mistake, I think, in taking his line northward to DICK'S FARM; it would have been better continued from BEECH WOOD to LONE HILL or BYNGS LODGE, the latter localities, as is recognised in most of the appreciations, are important as they allow of artillery fire being brought to bear at effective range on the convoy route near RONDAL and CROMER; DICK'S FARM, moreover, is too close to the convoy route to make it of value to hold—(Combined Training, section 153 (2) *b*). The winner however makes some amends by occupying TOR WOOD with cavalry; this might give time to bring the left of his line forward, should the enemy attack early in that direction.

There is, generally, not much to criticise in the appreciations or in the calculations of time and space, except that few competitors considered the possibility of an early move of Blue mounted force from BANSTEAD; for anything that is known to the contrary this force may only have done a short march to that place and it is quite possible if it learns (as it is likely to in a friendly country) of the position of the convoy that it will make a push forward, say, half way towards ALTON on the 1st which would bring it within 13 miles (2 hours' march) of the line to be protected, it might be on this line very early on June 2nd. It would, at all events, have been safer to consider such a possibility and to make dispositions accordingly.

The method of employment of the Red cavalry was in many cases not satisfactory; in some solutions the whole 2 squadrons were employed on night outposts, work which would be better done by infantry and which would render the cavalry less efficient for the next day—(Combined Training, section 73 (6)). The cavalry was also sent out late and was hampered by many precise and detailed orders as to its employment. Except for standing patrols, and the special reconnoitring patrols before mentioned, the bulk of the cavalry should have been withdrawn for the night; sent out very early on the 2nd, with orders to delay the enemy's advance and to protect the flanks of the Red position; the cavalry commander being given a free hand as to the method he would employ in attaining these objects, and not being restricted as to the distance he is to go, the routes he is to use, etc. [Combined Training, sections 115 (2-iv), 66 (5), 127 (1)]

In many cases an escort for the guns was not provided; when occupying such an extended front against a very mobile enemy it would be desirable to do so. In the winning solution an escort of cyclists is provided, this is not a very suitable arm for the duty; off roads it is less mobile than Infantry, and the guns will almost certainly have to move across country at times. A small escort of Cavalry would be most suitable. [Combined Training, section 119.]

The following faults were noticed in some of the Orders:—

Time of issue not noted. [Combined Training, Section 3 (14).]

Copy of orders not sent to G. O. C. Convoy for his information. [Combined Training, sections 95 (4), 112 (7).]

Companies and squadrons detailed by name, by O. C. Red Advance Guard; this is incorrect, the O. C. Force should detail "2 Companies No. 1 Battalion," not "E and F Companies, No. 1 Battalion"; the O. C. the unit would decide which of his two companies he would detail. In some cases separate sets of Operation Orders were issued to the Cavalry and to the remainder of the detachment; combined orders facilitate co-operation and should be used whenever possible. [Combined Training, section 3 (5).]

The O. C. a Flank Guard is responsible for the maintenance of communication with the Main Body. [Combined Training, section 53 (2) (3).] This was not provided for in some of the solutions.

THE JOURNAL

OF THE

United Service Institution of India.

Vol. XXXVII.

July 1908.

No. 172.

CO-OPERATION OF THE INDIAN ARMY AND THE NAVY.

By MAJOR W. H. BROWN, 103RD MAHRATTA LIGHT INFANTRY.

It may, perhaps, be safely assumed that there are, at any rate, some officers, who never heard of the existence of the Indian as distinct from the Royal Navy; and more who are unaware of the many occasions on which the Land and Sea Forces of India co-operated. Few if any of the actions in which they worked together are referred to in Colonel Callwell's book; and Lowe's "History of the Indian Navy" is, comparatively speaking, rare and not often met with. It is from this interesting work that the following notes have been collected. Some of the more important actions are dealt with *in extenso*; of the remainder only a brief sketch is given. Nothing is new under the sun, and none can say that the lessons of history, however old, may not be indented upon in the unknown future. Burma, China and Ashanti have been thrown upon the screen more than once already.

A salient point in the history is the good feeling which nearly always prevailed between the sister services—Callwell's book shows only too clearly that this was not always the case in other parts of the globe. The sailor's reputation as a "handy man" loses nothing from the recitation of these old-time actions. Sometimes he commanded combined forces—sometimes he played the part of a soldier pure and simple; but nearly always he came off with flying colours and proved to the hilt his ready wit.

One parallel we cannot pass without remark. Colonel Callwell relates how the Persian Fleet came to be turned into a land fort; does not the beaching of the ship on the Burmese coast while repairs were effected furnish us with a duplicate in miniature?

In February 1756 a combined Naval and Military Expedition sailed from Bombay to attack Gheria. The force was composed of

800 European and 300 Portuguese soldiers with 300 sepoy under Clive (afterwards Lord Clive); five ships of the Royal Navy, under Admiral Watson, and 10 Company's ships with which acted 44 Mahratta vessels. The Peishwa's troops had already been operating for some months and had reduced all the strong places north of Gheria. Toolaji was so frightened when the fleet appeared that he left the defence to his brother and surrendered to Ramaji Punt, offering a bribe to secure his freedom. The Mahratta General would not, however, come to terms. In due course the fleet commenced the bombardment and the pirate vessels were soon in flames. Shortly afterwards the fort was also set on fire. Admiral Watson then asked Clive to invest the fort on the land side, which was done; and soon afterwards the fort, hitherto considered impregnable, was surrendered. The British loss was trivial. Gheria was garrisoned by 600 British and Native soldiers aided by 4 of the Company's ships of war, and the remainder of the expedition returned to Bombay.

In 1748 a combined Naval and Military expedition sailed from Fort St. David to operate against Pondicherry. The fleet, the largest hitherto seen in the East Indies, consisted of 12 ships of the Royal Navy and 14 of the Company's vessels, manned by 3,580 seamen and carrying 1,200 Royal troops, 800 marines, 80 artillerymen and 750 of the Company's troops under Major Lawrence. The Admiral—Boscawen—landed 1,100 seamen to co-operate. Dupleix, however, made a successful defence, and, as the ships of war could not draw in close enough to assist, the siege was raised with a loss to our forces of more than 1,000 men.

In January 1761 Pondicherry was again besieged by a force under Admiral Cornish and Colonel Coote, and capitulated; when Lally and his garrison were made prisoners of war. On this occasion also, seamen were landed to co-operate. During the siege a violent hurricane came on and five ships were driven ashore.

In February 1759, at the request of the Mogul Admiral, an expedition was fitted out at Bombay to compass the capture of Surat. It consisted of 5 of the Company's ships, 850 European and 1,500 native troops under Commodore Watson of the Bombay Marine. The troops were landed 9 miles from Surat. The first thing to be effected was the dislodgment of the Seedee's sepoy from the "French Garden." Four of the Company's vessels moved up the river during the night and bombarded the Seedee's bandar. The troops were then landed and the Seedee's forces put to flight while the ships bombarded the fort, which after a time was surrendered. A garrison was left and the expedition returned to Bombay.

Early in 1768 a squadron, 400 European troops and a number of sepoy were despatched to attack Haidar Ali's forts on the Malabar coast. The latter had appointed a cavalry officer as his admiral, with the result that the fleet in disgust deserted to the British. Onore was soon captured and a small garrison was installed; with the result that soon after the expedition returned to Bombay Haidar Ali recovered it and all that he had lost in Canara.

In 1771 a futile expedition was sent to Broach to be followed by a more successful effort the next year, when General David Wedderburn was among the killed.

At the end of 1774 an expedition set out for the reduction of Tannah. It consisted of nearly 2,000 soldiers and several vessels of the Bombay Marine; the place was held by Mahratta troops opposed to the Peishwa. Bribery proving ineffectual the soldiers with some seamen were landed and after 8 days' bombardment the breach was considered practicable; and the second assault proving successful the garrison was put to the sword. Among the killed was Commodore Watson.

During Colonel Keating's operations for the reinstatement of Raghunath Rao the Bombay Marine lent valuable assistance, by destroying the Mahratta fleet off Gheria.

At the siege of Basscin in 1779 the Bombay Marine co-operated; the native troops proceeding by land while the Europeans were embarked on board marine vessels.

Mahi was reduced by a combined expedition in 1799.

In 1782 upon the death of Haidar Ali, General Matthews with a combined force captured the fort of Rajamandrug and proceeded to Onore, where other forces were ordered to concentrate. The fort was soon captured and Ananpur and Mangalore followed suit. The defence of Onore by Captain Torriano with less than 1,000 men against ten times the number was a brilliant episode of these times. The Bombay Marine played an important part in this affair as also at the capture of Cannanore.

England being at war with Holland in 1795, an expedition was sent for the reduction of Ceylon. Trincomali capitulated after a siege of three weeks and Jaffnapatam made no resistance. On the receipt of reinforcements Fort Negombo capitulated and Colombo soon afterwards surrendered.

In 1801 the Indian Navy co-operated on a small scale in the expedition against the Dutch possessions in the Moluccas; as a result of the operations the islands were ceded to the British.

It was intended to annex the island of Perim in 1799, but the ships sent for that purpose with 300 troops were obliged to abandon the enterprize owing to the scarcity of water.

In April 1801 the Navy co-operated in the first expedition to Egypt; but the details are so fully set forth in several works, including the "Life of Sir David Baird" that any further allusion to it here is unnecessary.

In 1809 a force under Colonel Keating, much assisted by the Navy, captured the harbour of S. Paul in Bourbon.

In 1810 it was decided to wrest Mauritius from the French, and preparations to effect this were begun simultaneously at the Cape and Bombay. Nineteen ships of war participated, and after a few skirmishes, in which the British force suffered a loss of some 150 men, the island was surrendered on the 3rd of December.

In 1811 attention was directed to Java and 31 ships of the Royal and Indian Navies took part in the expedition. Lord Minto

accompanied it, and Sir Samuel Auchmuty was in command of the troops, one division of which was led by the famous Colonel Gillespie. The expedition was entirely successful, though our forces sustained considerable losses.

In the following year Colonel Gillespie was in command of a force sent to punish the Sultan of Palimbang. It effected its purpose, and among the wounded was Colonel Gillespie.

In 1813 and 1814 minor expeditions were sent against the Sultan of Jambas and the Rajah of Bono: both were successful.

The pirates on the Katthiawar coast had been giving a good deal of trouble; and in 1811 Colonel Lionel Smith was sent in command of an expedition against them. A small squadron of the Indian Navy accompanied it. Operations continued on and off for several years, and, after some troublesome work, the pirates, who had previously been a thorn in the side of the Duke of Wellington, were brought into line.

During the Mahratta war in 1817-18 the ships proved of great assistance in the capture of the forts on the coasts of the Koncan. A naval brigade assisted at the capture of Severndrug in December 1817 as also at the capture of Madanghar, Ramghar, Palghar, Rasulghar, and Anjanwil.

For these operations the troops and the Navy received the thanks of the Governor of Bombay when he referred to "the most perfect cordiality" which existed between the two services.

THE JOASMI PIRATES.

In 1808 the Joasmi pirates, whose headquarters were at Ras-al-Khaima, on the western shores of the Persian Gulf, made their first appearance off the Indian coasts. They thenceforward came into constant conflict with the British. Their fleet is reported to have consisted of sixty-three large vessels, and over eight hundred smaller ones, manned by nineteen thousand men. An expedition for the purpose of freeing the Imam of Maskat from the power of the Wahabis, and at the same time for suppressing these pirates, was despatched to the Persian Gulf in 1809. The political instructions, however, so hedged the Commander round, that the results were not satisfactory.

The Naval portion of the expedition consisted of H. M. S. "Chiffonne" (36) and "Caroline" (36); with the Company's cruisers "Mornington" (22), "Ternate" (16), "Aurora", "Mercury", "Nautilus", and "Prince of Wales", 14 guns each; "Vestal" and "Ariel" 10 each; "Fury" (8), and the bomb-ketch "Stromboli". The troops, who were embarked on four large transports, were H. M. 65th Regiment, the flank companies of H. M. 47th Regiment, a detachment of Bombay Artillery and one thousand sepoy; the whole under the command of Colonel Lionel Smith of the 65th Regiment.

The "Stromboli" foundered twenty-four hours out of Bombay. She had long been condemned as unfit for service.

After a long passage Maskat was reached, and a stay of some days made there, to refresh and concert plans for the future. The Imam considered the force too small for the attack of Ras-al-Khaima, and his warning was prophetic of what was in store. The ships arrived at their destination on the afternoon of the 11th of November, but the water was so shallow that the frigates could not approach within 4 miles. The pirates were just starting on an expedition on their own account, but put back on seeing the hostile fleet. Their largest ship, the "Minerva," ran ashore under a small fort one mile above the town, but being attacked by the smaller vessels and gunboats, her crew were driven out of her, and she was taken possession of; but the heavy musketry fire, which was opened from the shore, obliged the captors to abandon her, after setting her on fire. The squadron now anchored abreast of the town, and preparations were made for the attack and for landing the troops, when some impression had been made upon the works. It was now seen that the enemy's prowess had been under-rated; and as the frigates could not get within three miles of the town, and the only bomb vessel had been lost, the prospect was not cheering. It was only possible for the smaller vessels to take part in the bombardment, and they accordingly opened with considerable effect, but the inhabitants kept up a cool and well-directed fire from the batteries and entrenchments, which did considerable mischief. The peninsula, upon which Ras-al-Khaima stands, is three quarters of a mile in length, and a quarter of a mile in breadth; across the latter was a high wall, flanked by four towers, and the sea-front was lined with the batteries and entrenchments, above alluded to, evidently erected under European supervision. The harbour, formed by this peninsula and the mainland, is about half a mile broad. The number of armed men in the place was about five thousand; but it was known that considerable reinforcements could be received in a few days from the adjacent ports. Towards the outer end of the harbour, the houses were so close to the landing place that the disembarkation appeared to be impracticable; the wall across the isthmus opposed a serious obstacle at the southern end of the town; while the strong garrison, and the numerous hostile nomad population, rendered it undesirable for the small British force to undertake regular siege operations. However, the party were ordered to be in readiness to disembark at 2 A.M. on the 13th. The main body, consisting of H. M. 65th Regiment, the flank companies of the 47th and detachments of Marines and Indian troops, rendezvoused alongside one of the cruisers stationed off the south end of the town; while two gunboats and the ship's boats, with a few troops, pulled in towards the mouth of the harbour. The latter opened a heavy fire at dawn upon the north end of the town, which impressed the enemy with the idea that they were trying to force their way into the harbour. Their whole attention was consequently attracted to that point, and a heavy fire of musketry was opened by them, which was the signal for the main body of the British troops to land, at the other end of the

town, and push on to the wall. The enemy perceived this manœuvre too late, and as the fire which they opened from the towers and buildings was ineffectual, they came boldly down to the beach to dispute the landing, sword in hand. The troops had been ordered to form under the side of the breach, which would afford some measure of security from the enemy's fire; but, before one company had been landed, a desperate attack was threatened on their left. The steadiness and discipline of the crews of the gunboats which had been stationed to flank the landing, was at this time invaluable. Reserving their fire until the enemy were almost in contact with the troops they poured in a heavy fire of grape, which checked the onslaught and gave time for the British advanced guard to form up. These in their turn made a desperate and successful charge; and as the sun rose above the mountain which formed the back ground, the Cross of St. George floated above the towers of Ras-al-Khaima.

The troops were now eager to advance into the town, but their commanders were too prudent to act hastily. The place was known to be occupied by a well-armed population; so the land wall and towers were first taken possession of, and in the meanwhile field pieces, ammunition, and scaling ladders were landed. When all was ready for the advance, an attack was made upon some of the most commanding buildings, by effecting lodgments in adjacent ones, supported by artillery fire and the cross-fire of the gunboats; but the obstinacy of the defence showed that this method would be very tedious. In this, as in most eastern towns, the houses of the poor intermingled with those of the rich; and the whole presented a motley appearance. The former were built of palm leaves, and the latter of substantial white bricks. Most of the larger houses became separate fortifications which, in the result, led to their destruction; for by setting fire to the huts, the flames were fanned by the wind, which blew from the point of disembarkation, and the Joasms were gradually smoked out of their positions. The defenders of some of the buildings, however, yet made a gallant and prolonged resistance. In one instance a large house was defended even after the British had scaled the roofs, and dropped hand-grenades through holes worked by the bayonet; when at last its defenders rushed out, and made a gallant though vain attempt to cut their way through the troops which surrounded it.

It was 2 P.M. before the British troops had worked their way to the centre of the town, where the Shaikh's palace was situated. It was expected that a desperate attempt to rally would have been made here; but the compact order of the British was not to be shaken, and, aided by the destructive fire of the artillery, they soon expelled the enemy. The height of the building, commanding as it did the neighbourhood, made it the key of the position; and the enemy found any further ordered resistance vain. They still, however, defended the north end of the town; while the inhabitants were permitted to make their escape in boats across the harbour.

By 4 P.M. the seamen had set fire to upwards of fifty vessels; many of these being large war dhows. The guns of some of the latter were loaded, and many of them and of the houses contained depôts of gunpowder, the explosion of which, together with the conflagration in the town and harbour, added to the scene of desolation. Ras-al-Khaima was found to contain goods of considerable value; and the enemy appeared to have been so confident of success that nothing had been removed into the interior; many warehouses, filled with valuable goods, were burned. The British acted on the principle that they had come to exact retribution and not for gain; or much valuable plunder might have been taken away. Looting was strictly prohibited, and only a few jewels and a little treasure was taken off to the ships by the individual captors, with the Commander's permission. The British loss was trifling, considering the resistance met with, while at least 300 of the Joasimis were killed.

The condign punishment thus meted out was deprived of some of its deterrent effects by the hasty re-embarkation of the troops. The hurried exit reassured the Joasimis, who, far from giving way to depression at the sight of their desolate hearths, again opened fire upon the troops. The embarkation took place at daylight in the morning, and, while the fleet remained at anchor, parties continued to assemble on the shore, displaying their banners, brandishing swords and spears, and discharging their muskets from every point; the conquest therefore was not so complete as would have been desirable, no formal act of submission having been made. Reports had been received that the enemy was about to receive reinforcements; but whether this or the lukewarm instructions of the Government hastened the embarkation is not known.

The expedition now sailed for Lingeh, a port on the Persian coast, near the island of Kishm. The very appearance of the squadron however, terrified the people, who fled to the hills, taking their goods and chattels with them. The town was occupied without resistance and burned; and twenty vessels, including nine war dhows, destroyed. H. M. S. "Caroline," with the transports and the bulk of the troops proceeded to Birkeh, some 40 miles from Maskat, for supplies. Other ships were occupied in blockading and exploring duties; and two proceeded to the eastward of Kishm to prevent the escape of the Luft pirates. On the 24th November Commodore Wainwright, with six ships carrying five hundred troops, having obtained pilots, started for Luft, on the north of Kishm, which was reached on the 26th. A summons to surrender was sent on shore, as the people had taken post in a large and fortified castle. The negotiations were protracted for twenty-four hours; but the Chief, Mulla Hussain, would come to no decision, and at 2 o'clock on the 27th the troops, under Colonel Smith, were landed. There was a slight skirmish on the beach, but the enemy took refuge in the castle, the walls of which were 14 feet thick and well supplied with loopholes; there was only one small gate, of considerable strength, which it was intended to

blow in with a howitzer ; as soon, however, as the troops opened out to surround the castle, prior to storming, they were picked off promptly from the loopholes and fled, abandoning the howitzer before it had fired a shot, and taking what cover they could find. An Irish officer, who jumped up and called for men to rescue the howitzer, was at once shot, and those who peered above their cover to take stock of their surroundings soon received their quietus from the same unerring aim. It was resolved to remain under cover till night, and then to re-embark. Meanwhile the gunboats and the "Fury" got within musket shot of the fort, and opened a heavy fire upon the castle, which caused much damage ere sunset. Again Mulla Hussain was summoned, under penalty of another bombardment, and a threat of no quarter—rather an un-English idea, this latter. As dawn broke all eyes looked towards the castle, and to everyone's surprise the Union Jack was seen flying from the walls. It transpired that Lieutenant Hall, of the Bombay Marine, Commander of the ill-fated "Stromboli", had proceeded on shore alone during the night and advanced to the castle gate, from which most of the inhabitants had already withdrawn. The remainder, who had had by this time quite enough bombardment, and who naturally supposed that no one would be so foolhardy as to carry out such a plan without support being at hand, fled. The usual retribution followed, and much burning was indulged in ; but the bulk of the property having originally belonged to the Imam of Maskat was restored to him. The loss in this affair was very heavy, as there were twenty-seven killed in the squadron alone.

The squadron now proceeded to other towns, but, limited by the orders of Government, destroyed only such vessels as were found there. They then returned to Birkeh Roads, and concerted fresh measures with the Imam, who was no less surprised at the Ras-al-Khaima success than pleased at the recovery of Luft. Spinās, north-west of Sohar, and Khor Tukaun were selected as the objects of the next attention. The former had a strong fort, but the latter was built on the shores of a sandy bag and was a place of no importance. On the 31st of December the squadron reached Shinas, and a summons was sent to the Wahabi Chief ; a prompt refusal being his answer. A bombardment was immediately opened with but little result. On the following day all the troops were landed and encamped on the shore, and erected a battery and other siege works. A heavy bombardment, during which four thousand shot and shell were expended, was carried out during the night against the castle, whither the people had withdrawn, after burning the town. Next morning Colonel Smith, admiring their courage, gave them yet another opportunity of surrender ; but the same defiant answer was received. Although the walls were crumbling all round them, from the effect of the bombardment, the plucky defenders actually hurled back the grenades before they could burst and thrust with their spears through the ruins among which they lay buried. Twice more Colonel Smith ordered firing

to cease, to give them another opportunity of changing their minds; but it was not till a practicable breach had been made that they surrendered, on a promise of protection from the Imam's troops, who participated in the attack. The enemy's loss in killed and wounded was about one thousand.

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In spite of the punishment they had received the pirates were by no means done with; and after some years of provocation the Bombay Government made up their minds to extinguish piracy on the Persian Gulf for ever. Orders were therefore issued for the formation of yet another expedition at Bombay. The Royal Navy was represented by H. M. S. "Liverpool" (50), Captain Collier, C.B. in command of the Naval division; and H. M. S. "Eden" (26), and "Curlew" (18)—The Company's ships were "Teignmouth" (16); "Benares" (16); "Aurora" (14); "Nautilus" (14); "Ariel" (10); "Vestal" (10).

The military portion of the force consisted of one Company of Artillery, H. M. S. 47th and 65th Regiments, 1st Battalion 2nd Native Infantry, flank companies of the 1st Battalion 3rd Native Infantry, the Marine Battalion, and half a company of Pioneers, all under Major-General Sir W. G. Keir, 18 transports were taken up, and the two British Regiments, with the Artillery, embarked on the 30th of October, the remainder following suit next day. A few days more were occupied in taking up extra store and hospital ships, as the transport did not afford sufficient accommodation for the latter. The first portion of the expedition, with head-quarters, finally started on the 3rd of November, followed in a few days by the remainder. It was high time that the Joasmis were suppressed, for at this period a fleet of 64 vessels with crews aggregating 7,000 was cruising off Kathiawar and Cutch, and 35 more off Makran and Sind.

The fleet proceeded to the rendezvous at Kishm; while the "Liverpool," with the Naval and Military chiefs, went on to Maskat to interview the Imam, who had promised a force of 4,000 men and three war vessels. Sir Grant Keir now sailed to reconnoitre Ras-al-Khaima, and falling in with the "Benares" took her with him to assist in the blockade of the place.

Sir Grant Keir, after two days' inspection of the defences, considered that the force already at Kishm would suffice for the reduction of the place and the "Benares" was despatched to summon the fleet, which, arriving on the 2nd of December, arrangements were immediately made to disembark the troops. During the afternoon four more transports from Bombay, and the Imam with 2 frigates and 600 men joined the force. On the following day

the disembarkation was carried out with great speed, considering the distance from the shore, at which the ships were obliged to anchor, and the insufficiency of means for transporting such a large force with guns, supplies and siege material. The gunboats and armed launches covered the operation. The troops were landed two miles from the town, and the Imam's contingent did very valuable work. The "Aurora" and "Nautilus" brought up at the mouth of the creek, and created a diversion by firing in that direction; this possibly explains the slight resistance that was opposed to the landing. A body of 500 seamen was landed from the ships, to assist in the siege operations, and helped to work the guns in the batteries.

An officer of the Bombay Marine, who was present, thus describes the defences of Ras-al-Khaima:—"The town was walled along the sea-face, across the end nearest the point, and also across the south-west face, the walls, which were well-built being about nine feet high and two feet thick. At intervals were round towers about twenty feet high, the lower half of solid masonry, and a small store or guard-room between this portion and the roof which was surrounded by a parapet with loopholes for guns instead of embrasures. The side next the creek was open but had a number of guns planted along it. To the southward of the town was a square fort, in which were mounted some small guns. On the island of Mahara, opposite the town, was also a strong tower, and there were several more in the date groves. The number of men in the town at the time of the arrival of the expedition is said to have amounted to near seven thousand, but from various enquiries I have made since, I do not think it exceeded at any time four thousand. These consisted of the Joasmis, Toal, Shakine and Motarish tribes, and there were also about one thousand mercenaries who had been in the Mahratta service. A very large portion of the property of the place was removed, on the arrival of the expedition, to the date groves; most of the women and children were also sent there, and the Chief, Hassan Bin Rahma, with his brother Ibrahim, prepared for the defence."

The following is Sir William Grant Keir's despatch describing the operations.

"The troops were formed across the isthmus connecting the peninsula, on which the town is situated, with the neighbouring country, and the whole of the day was occupied in getting tents on shore to shelter the men from the rain, landing engineer's tools, sand-bags, etc., and making arrangements preparatory to making our approaches the next day. On the morning of the 4th the light troops were ordered in advance, supported by the picquets, to dislodge the enemy from a bank within 900 yards of the outer fort, which was expected to afford good cover for the men, and to serve as a *dépôt* for stores previous to the erection of the batteries. The whole of the light companies of the force, under command of Captain Backhouse of H. M. S. 47th Regiment, accordingly moved forward, and drove the Arabs with great gallantry from a date grove, and

over the bank above described, close under the walls of the fort, followed by the picquets under Major Molesworth, a gallant and zealous officer, who took post at the sand bank, whilst the European light troops were skirmishing in front. The enemy kept up a sharp fire of musketry and cannon during these movements; and I regret to add that Major Molesworth was killed by a cannon shot at the head of the picquets; Lieutenant Stepney of the 65th was wounded on this occasion. The troops, however, maintained their position during the day, and in the night effected a lodgment within 300 yards of the southernmost tower, and erected a battery for four guns, together with a mortar battery on the right and a trench of communication for the protection of the covering party. The weather having become rather unfavourable for the disembarkation of the stores required for the siege, it was with considerable difficulty that the primary object was effected; but every obstacle was surmounted by the zeal and indefatigable exertions of the Navy, and on the morning of the 6th we were enabled to open three 18-pounders on the fort; a couple of howitzers and 6-pounders were also placed in the battery on the right, which played on the defences of the towers, and nearly silenced the enemy's fire. The "Liverpool," during these operations, warped in as close to the shore as her draught of water would permit, and opened her guns on the town, which must have created considerable alarm in the garrison, but she was unfortunately at too great a distance to produce any decided effect. The enemy, who during the whole of our progress, displayed a considerable degree of resolution in withstanding, and ingenuity in counteracting an attack, sallied forth at 8 o'clock this evening along the whole front of our intrenchments, crept close up to the mortar battery without being perceived, and entered it over the parapet after spearing the advanced sentries. The party which occupied it was obliged to retire, but being immediately reinforced, charged the assailants, who were driven over of the battery with considerable loss. The attack on the left was repelled instantaneously by the spirited resistance of the covering party under Major Warren, who distinguished himself much on this occasion by his coolness and gallantry. The enemy repeated his attack towards the morning, but was vigorously repulsed. During the 7th every exertion was made to land and bring up the remaining guns and mortars, which was accomplished during the night, after incessant labours by the sailors, assisted by working parties from the troops, and those of His Highness the Imam, who cheerfully volunteered their services. They were immediately placed in battery, together with two 24-pounders, which were landed from the "Liverpool," and in the morning the whole of our ordnance opened on the fort and fired with scarcely any intermission till sunset, when the breach on the curtain was reported nearly practicable, and the towers almost untenable. Immediate arrangements were made for the assault, and the troops ordered to move down to the trenches at day-break the next morning. The bombardment continued during the night, and the

batteries having recommenced the fire before daylight, completed the breaches by 8 o'clock. The accompanying orders will explain to His Excellency the disposition of attack, as well as the measures taken to guard against the possibility of a failure, in the event of the enemy defending himself as desperately as might have been expected from his previous defence. These precautions, however, were unnecessary, the party moved forward about 8 o'clock and entered the fort without firing a shot, and it soon appeared that the enemy had evacuated the place. The town was taken possession of and found almost entirely deserted, only eighteen or twenty men and a few women remaining in their houses. Upon the whole, it appears evident, considering the spirited behaviour of the enemy at the commencement of the siege, that their sudden resolution to evacuate the place was occasioned by the overwhelming fire of the artillery, of which they could have formed no previous idea, and which the ample means placed at my disposal, enabled me to bring against the town. Our loss, I am happy to say, is much less than could have been expected from the length of the siege, and the obstinacy with which the enemy disputed our approaches. I have had no means of ascertaining theirs, but it must have been severe. I beg that you will assure His Excellency that I feel entirely satisfied with the conduct of the troops, their gallantry has been exceeded only by their patience and cheerfulness under every species of privation and fatigue, and the peculiarity of this service has called forth a display of these qualities which are equally creditable to the soldier as the most intrepid act of bravery. By the orders which I do myself the honour to enclose, His Excellency will be enabled to estimate the services performed by Captain Collier and the naval part of the expedition, and I can only add that the acknowledgments expressed are scarcely adequate to the assistance I have received from them."

A Joasmi spy brought news that as a result of the bombardment on the 5th the enemy had suffered a loss of 90 killed, exclusive of wounded; among the latter being the Shaikh's brother who had lost a leg.

The soldiers in the trenches were relieved every four hours but the sailors only once in twenty-four. The fire of the Arabs slackened off considerably on the 6th and they were evidently running short of ammunition, as large stones were fired, generally wide of the mark; and the Arabs picked up and returned our round shot.

An eye-witness described the night sortie referred to in the despatch. The night was very dark and the picquet on the alert. At about 1 A.M., an object resembling a dog, followed by others, was discovered creeping along. The advanced picquets were instantly cut down, and the Arabs swarmed into the trenches, and joined in a hand to hand encounter with the defenders; spearing and stabbing right and left. They also dragged away a howitzer in triumph. The reserve came up and recaptured the howitzer; the Arabs fought like fiends but were all soon bayonnetted, 90 being found dead in the trenches.

The 24-pounders were landed from the "Liverpool," as the lighter guns appeared to make no impression on the walls and towers. The enemy, unable to use the larger shots, fell back upon their own stones and grape.

The following anecdote is told regarding 'Jack's' irrepressibility. During the hottest part of the cannonade, a bullock and a white cock were viewed close under the wall, under fire from our batteries, but unharmed. Two sailors calculated that they would be acceptable for their mess; and vaulting over the wall, ran towards them; fire being slackened for the purpose, and the men in the trenches cheering them on. The Arabs opened a brisk fire upon them but one sailor coolly drove the bullock before him, while the other captured the cock. They returned safely to the trenches, and the spoil was soon cooked and eaten. The Officer in Command, so far from being able to reprove the breach of discipline, thoroughly enjoyed the joke.

The total loss during the siege was one officer and four men killed, and three officers and forty-nine men wounded, the enemy's loss was estimated at one thousand killed and wounded, and sixty-two guns were captured, while the Chief and one thousand of his followers surrendered as prisoners. The Chief reported that a single shell bursting in a room had killed and wounded one hundred.

Three of the ships were now sent to blockade Rams, six miles north-east of Ras-al-Khaima; but it was found to be deserted, it being reported that the inhabitants had taken shelter in the fort at Zayah, two miles inland. As the place was said to contain a garrison of four hundred, under the Vakil of a famous Wahabi Chief, it was necessary to subdue him, and prevent him from returning to his former piratical habits; and a strong force was landed, with two of the Liverpool's 24-pounders, to effect this object. The work was short but sharp, owing to the determined defence. Ensign Mattieson, of the 65th, was killed during the investment, between the 18th and 22nd of December. At half past eight A.M. on the latter date fire was opened to effect a breach, and to destroy the defences of the Shaikh's house in the town. As soon as all was ready for the assault a white flag was hoisted; and nearly four hundred men marched out and surrendered. The prisoners were taken on board the ships and landed at Ras-al-Khaima. The British loss was one officer and three men killed, and sixteen men wounded.

A Military Officer thus describes the operations at Zayah: "A strong fort on a neighbouring hill called Zaire still held out. The duty undertaken by the seamen was most arduous in this case; two 24-pounders were dragged by the poor fellows for a space of two miles over rough and swampy ground. After batteries had been erected, a brisk cannonade was kept up against the fort, and shells were thrown without intermission. The fire was unremitting and tremendous. The fort was deemed quite impregnable by the natives, but they had soon speedy reason for entertaining a mortifying belief to the contrary; they accordingly manifested a wish to capitulate. The General offered unconditional surrender, which

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Sir Grant Keir, after two days' inspection of the defences, considered that the force already at Kishm would suffice for the reduction of the place and the "Benares" was despatched to summon the fleet, which, arriving on the 2nd of December, arrangements were immediately made to disembark the troops. During the afternoon four more transports from Bombay, and the Imam with 2 frigates and 600 men joined the force. On the following day

the disembarkation was carried out with great speed, considering the distance from the shore, at which the ships were obliged to anchor, and the insufficiency of means for transporting such a large force with guns, supplies and siege material. The gunboats and array of launches covered the operation. The troops were landed two miles from the town, and the Imam's contingent did very valuable work. The "Aurora" and "Nautilus" brought up at the mouth of the creek, and created a diversion by firing in that direction, this possibly explains the slight resistance that was opposed to the landing. A body of 500 seamen was landed from the ships, to assist in the siege operations, and helped to work the guns in the batteries.

An officer of the Bombay Marine, who was present, thus describes the defences of Ras-al-Khaima:—"The town was walled along the sea-face, across the end nearest the point, and also across the south west face, the walls, which were well-built being about nine feet high and two feet thick. At intervals were round towers about twenty feet high, the lower half of solid masonry, and a store or guard-room between this portion and the roof which was surrounded by a parapet with loopholes for guns instead of embrasures. The side next the creek was open but had a number of guns planted along it. To the southward of the town was a square fort, in which were mounted some small guns. On the island of Mahara, opposite the town was also a strong tower, and there were several more in the date groves. The number of men in the town at the time of the arrival of the expedition is said to have amounted to near seven thousand, but from various enquiries I have made since, I do not think it exceeded at any time four thousand. These consisted of the Joasims, Toal, Shakin and Motarish tribes, and there were also about one thousand mercenaries who had been in the Mahratta service. A very large portion of the property of the place was removed on the arrival of the expedition to the date groves, most of the women and children were also sent there, and the Chief Hassan Bin Rahma, with his brother Ibrahim prepared for the defence."

The following is Sir William Grant Keith's despatch describing the operations:

"The troops were formed across the isthmus connecting the peninsula on which the town is situated with the neighbouring country, and the whole of the day was occupied in getting tents on shore to shelter the men from the sun, landing engines, stores, and-bags, etc., and making arrangements preparatory to making an approach the next day. On the morning of the 4th the light troops were ordered in advance, supported by the pipers, to dislodge the enemy from a bank within 1000 yards of the water, at which was expected to afford good cover for the men, and to serve as a depot for stores previous to the erection of the batteries. The whole of the light companies of the force, under command of Captain Blackhouse of H. M. S. 47th Regiment, accordingly moved forward, and drove the Arabs with great gallantry from a date grove and

over the bank above described, close under the walls of the fort, followed by the picquets under Major Molesworth, a gallant and zealous officer, who took post at the sand bank, whilst the European light troops were skirmishing in front. The enemy kept up a sharp fire of musketry and cannon during these movements; and I regret to add that Major Molesworth was killed by a cannon shot at the head of the picquets; Lieutenant Stepney of the 65th was wounded on this occasion. The troops, however, maintained their position during the day, and in the night effected a lodgment within 300 yards of the southernmost tower, and erected a battery for four guns, together with a mortar battery on the right and a trench of communication for the protection of the covering party. The weather having become rather unfavourable for the disembarkation of the stores required for the siege, it was with considerable difficulty that the primary object was effected; but every obstacle was surmounted by the zeal and indefatigable exertions of the Navy, and on the morning of the 6th we were enabled to open three 18-pounders on the fort; a couple of howitzers and 6-pounders were also placed in the battery on the right, which played on the defences of the towers, and nearly silenced the enemy's fire. The "Liverpool," during these operations, warped in as close to the shore as her draught of water would permit, and opened her guns on the town, which must have created considerable alarm in the garrison, but she was unfortunately at too great a distance to produce any decided effect. The enemy, who during the whole of our progress, displayed a considerable degree of resolution in withstanding, and ingenuity in counteracting an attack, sallied forth at 8 o'clock this evening along the whole front of our intrenchments, crept close up to the mortar battery without being perceived, and entered it over the parapet after spearing the advanced sentries. The party which occupied it was obliged to retire, but being immediately reinforced, charged the assailants, who were driven over of the battery with considerable loss. The attack on the left was repelled instantaneously by the spirited resistance of the covering party under Major Warren, who distinguished himself much on this occasion by his coolness and gallantry. The enemy repeated his attack towards the morning, but was vigorously repulsed. During the 7th every exertion was made to land and bring up the remaining guns and mortars, which was accomplished during the night, after incessant labours by the sailors, assisted by working parties from the troops, and those of His Highness the Imam, who cheerfully volunteered their services. They were immediately placed in battery, together with two 24-pounders, which were landed from the "Liverpool," and in the morning the whole of our ordnance opened on the fort and fired with scarcely any intermission till sunset, when the breach on the curtain was reported nearly practicable, and the towers almost untenable. Immediate arrangements were made for the assault, and the troops ordered to move down to the trenches at day-break the next morning. The bombardment continued during the night, and the

batteries having recommenced the fire before daylight, completed the breaches by 8 o'clock. The accompanying orders will explain to His Excellency the disposition of attack, as well as the measures taken to guard against the possibility of a failure, in the event of the enemy defending himself as desperately as might have been expected from his previous defence. These precautions, however, were unnecessary, the party moved forward about 8 o'clock and entered the fort without firing a shot, and it soon appeared that the enemy had evacuated the place. The town was taken possession of and found almost entirely deserted, only eighteen or twenty men and a few women remaining in their houses. Upon the whole, it appears evident, considering the spirited behaviour of the enemy at the commencement of the siege, that their sudden resolution to evacuate the place was occasioned by the overwhelming fire of the artillery of which they could have formed no previous idea, and which the ample means placed at my disposal, enabled me to bring against the town. Our loss, I am happy to say, is much less than could have been expected from the length of the siege, and the obstinacy with which the enemy disputed our approaches. I have had no means of ascertaining theirs, but it must have been severe. I beg that you will assure His Excellency that I feel entirely satisfied with the conduct of the troops, their gallantry has been exceeded only by their patience and cheerfulness under every species of privation and fatigue, and the peculiarity of this service has called forth a display of those qualities which are equally creditable to the soldier as the most intrepid act of bravery. By the orders which I do myself the honour to enclose, His Excellency will be enabled to estimate the services performed by Captain Collier and the naval part of the expedition, and I can only add that the acknowledgments expressed are scarcely adequate to the assistance I have received from them.

A Jesuit spy brought news that as a result of the bombardment on the 5th the enemy had suffered a loss of 90 killed, exclusive of wounded; among the latter being the Sheikh's brother who had lost a leg.

The soldiers in the trenches were relieved every four hours but the sailors only once in twenty-four. The fire of the Arabs slackened off considerably on the 6th and they were evidently running short of ammunition as large stones were fired generally wide of the mark; and the Arabs picked up and returned our round shot.

An eye-witness described the night scene referred to in the dispatch. The night was very dark and the position the alert. At about 1 A.M., an object resembling a dog followed by others, was discovered creeping along. The advanced pickets were instantly cut down, and the Arabs swarmed into the trenches and joined in a hand to hand encounter with the defenders, spearing and stabbing right and left. They also dragged away a howitzer in triumph. The reserve came up and recaptured the howitzer, the Arabs fought like fiends but were all soon bayoneted, 90 being found dead in the trenches.

The 24-pounders were landed from the "Liverpool," as the lighter guns appeared to make no impression on the walls and towers. The enemy, unable to use the larger shots, fell back upon their own stones and grape.

The following anecdote is told regarding 'Jack's' irrepressibility. During the hottest part of the cannonade, a bullock and a white cock were viewed close under the wall, under fire from our batteries, but unharmed. Two sailors calculated that they would be acceptable for their mess; and vaulting over the wall, ran towards them; fire being slackened for the purpose, and the men in the trenches cheering them on. The Arabs opened a brisk fire upon them but one sailor coolly drove the bullock before him, while the other captured the cock. They returned safely to the trenches, and the spoil was soon cooked and eaten. The Officer in Command, so far from being able to reprove the breach of discipline, thoroughly enjoyed the joke.

The total loss during the siege was one officer and four men killed, and three officers and forty-nine men wounded, the enemy's loss was estimated at one thousand killed and wounded, and sixty-two guns were captured, while the Chief and one thousand of his followers surrendered as prisoners. The Chief reported that a single shell bursting in a room had killed and wounded one hundred.

Three of the ships were now sent to blockade Rams, six miles north-east of Ras-al-Khaima; but it was found to be deserted, it being reported that the inhabitants had taken shelter in the fort at Zayah, two miles inland. As the place was said to contain a garrison of four hundred, under the Vakil of a famous Wahabi Chief, it was necessary to subdue him, and prevent him from returning to his former piratical habits; and a strong force was landed, with two of the Liverpool's 24-pounders, to effect this object. The work was short but sharp, owing to the determined defence. Ensign Mattieson, of the 65th, was killed during the investment, between the 18th and 22nd of December. At half past eight A.M. on the latter date fire was opened to effect a breach, and to destroy the defences of the Shaikh's house in the town. As soon as all was ready for the assault a white flag was hoisted; and nearly four hundred men marched out and surrendered. The prisoners were taken on board the ships and landed at Ras-al-Khaima. The British loss was one officer and three men killed, and sixteen men wounded.

A Military Officer thus describes the operations at Zayah: "A strong fort on a neighbouring hill called Zaire still held out. The duty undertaken by the seamen was most arduous in this case; two 24-pounders were dragged by the poor fellows for a space of two miles over rough and swampy ground. After batteries had been erected, a brisk cannonade was kept up against the fort, and shells were thrown without intermission. The fire was unrelenting and tremendous. The fort was deemed quite impregnable by the natives, but they had soon speedy reason for entertaining a mortifying belief to the contrary; they accordingly manifested a wish to capitulate. The General offered unconditional surrender, which

after half-an-hour's deliberation, was acceded to. Shaikh Husain Bin Ali, the Chief, was sent prisoner on board one of the transport. He was the most active, and the most cruel, of the pirates, about thirty years of age, handsome in person, mild in demeanour, but with a look of sullen, tiger-like ferocity, lurking in his restless eye. On our return to Ras-al-Khaima, we found the place totally in ruins; the fort and towers having been blown up by the indefatigable soldiers and seamen employed on the duty. A strong work was in a state of forwardness for such of our troops as it might be deemed requisite and expedient to leave behind for the entire prevention of future piracies, and a check upon the Arabs in their attempts to rebuild their forts and strongholds. On the 3rd of January we quitted the coast and proceeded to the different harbours in the vicinity, in order to capture and destroy all the piratical vessels and small craft. This operation was carried into complete effect, and it is hoped has succeeded effectually in destroying the roots and nipping the branches of piracy for a long period to come."

"John" Company rewarded the men liberally; in addition to the prize property realized by the agents, the full valuation of boats captured and destroyed, aggregating over two and a half lakhs of rupees, was distributed.

Treaties were effected and the expedition returned to Bombay.

THE BENI-BU-ALI ARABS.

In 1820 complications arose with the Beni-bu-Ali Arabs, which, owing to Military mismanagement, led to a great disaster. These Arabs were a fierce and turbulent race, inhabiting Jaalan, a province belonging to the Imam of Maskat, whose authority they had just thrown off. They are said to be identical with the Blenlai, mentioned by Pliny. Government had heard of some irregularities on the part of people of the Ashkara, a small place near Ras-al-Hadd, belonging to the Beni-bu-Ali Arabs. Captain Thompson, the Political Resident, was ordered to proceed against them, should their conduct be proved to have been piratical. The "Mercury," 14 guns, was accordingly despatched with a letter which, the surf being too high to allow of the passage of a boat, was taken on shore by the pilot who swam. On landing he was immediately cut to pieces. Captain Thompson at once determined to execute reprisals; and six companies of the 1st Battalion Native Infantry and Marine Battalion, with a party of Artillery and eight guns were embarked on H.M.S. "Curlew," and the Company's cruisers "Ternate," "Prince of Wales," "Mercury" and "Psyche" which sailed for Maskat, where a plan of operations was arranged with the Imam. It was decided to proceed to Sohar, there to be joined by two thousand of the Imam's troops. One hundred seamen were to have accompanied the force; but owing to differences between Captain Thompson and the Senior Naval Officer, they were re-embarked; and the subsequent mishap was to be largely attributed to the incident.

On the 1st November the detachment marched from Sohar with the Imam's contingent, 26-pounders, two howitzers and two iron 18-pounders, and nine hundred camels and draught cattle. After a fatiguing march the force arrived on the 8th of November near Bilad Beni-bu-Ali, the capital of the tribe. An entrenched camp was formed and a summons sent for the surrender of the fortifications and the town, together with the murderers of the pilot. It was pointed out that the Imam was acting on account of the murder, and the British on account of acts of piracy committed. The Arabs agreed to the terms, with the exceptions of the surrender of their arms. Unhappily Captain Thompson would not abate his demands.

The force, leaving a guard over the camp, marched against the enemy's town, which was situated with its rear resting on a deep date-grove, round which it was necessary to defile to reach the assailable front, which faced the plain, and was protected by ditches. On arriving within sight of the town the light company of the 2nd Native Infantry opened fire, and began to fall back according to orders; and soon a thousand of the enemy appeared on some elevated ground, and threatened the right flank. The troops were ordered to fall in in their direction and charge bayonets. The sepoys hesitated to obey the latter part of the order and opened fire; but the enemy, undismayed, continued to advance, broad sword in hand, and attacked the wavering ranks. Instantly a terrible scene of slaughter and confusion occurred. The officers vainly tried to rally their men who broke and, mingling with the Imam's troops in the rear, threw them also into confusion. The whole force now fled, pursued by the enemy as far as the camp, two hundred and seventy men were killed, and six or eight officers. The Arabs gave no quarter to the wounded, and even dragged the surgeon, who was sick, from his palanquin and butchered him. The Imam displayed great courage and was subsequently presented with a sword by the Governor-General. The enemy made an unsuccessful attack upon the camp during the night; but Captain Thompson and the Imam, realizing that it could not be held, retired to Maskat, which was reached on the 17th of November, whence Captain Thompson returned with his force to Deristan.

As soon as the news of the disaster reached Bombay the Government recalled and censured Captain Thompson, and prepared another expedition. It was commanded by Major-General Lionel Smith, C.B., of Ras-al-Khaima fame, and was embarked in fifteen transports, which were accompanied by the following ships of the Company's marine:—"Teignmouth," "Prince of Wales," "Psyche" and "Vestal."

The expedition sailed on the 11th of January 1821, and arrived at Sohar on the 27th, where it disembarked.

Before it set out it nearly met with a catastrophe, as the Arabs made a night attack which only just missed being successful. The main camp had been pitched some distance from the beach, where the General had taken up his quarters with the Bombay European Regiment. The Arabs seeing this determined to attempt to capture or kill the General with his party. Three hundred of

them accordingly made a flank march of fifty miles on the night of the 10th of February, and fell on the sleeping and unsuspecting camp. They had, however, reckoned without their host; and were repulsed after some sharp fighting. The British lost one officer and sixteen men killed, and three officers, including Colonel Cox, the Brigadier, and twenty-three men wounded. The enemy lost twenty-three killed and wounded. The General, warned by this experience, moved to the main camp.

Transport having been procured from the Imam, the division, accompanied by sixty seamen and the remains of the detachment of the Marine Battalion, started for the interior; and on the 2nd of March arrived before the tribe's capital. The Bedouins left their defences and advanced to give battle. The Arabs, thinking to repeat their former tactics, charged down on the bayonets with broad sword and target. Disregarding the showers of grape they fought with desperate valour and strove to find the weak points of the line, with the fanaticism engendered by their religion, and in vain attempted to break the death-dealing squares. Their gallantry, however, unsurpassed in the annals of war, was in vain. Of less than one thousand warriors engaged, five hundred were left on the field, dead or wounded; and two hundred and thirty-six, of whom ninety-six were wounded, were made prisoners. The main attack was directed against the right brigade, consisting of 400 of H. M. S. 65th Regiment and three hundred of the 1st battalion 7th Native Infantry and of the twenty-nine killed and one hundred and seventy-three wounded, four killed and thirty-eight wounded belonged to the former, and twenty-two killed and one hundred and twenty-six wounded to the latter regiment. The war ended with the cannonade and capture of the fort.

The 65th had played a distinguished part in the Indian warfare of this period, much of it in company with the Bombay Marine. Its first services were during the Mahratta war. It took part in the first expedition against the Joasmis. Then it was employed in the reduction of Mauritius, followed by the expedition against the Chief of Nowanagar, in Kathiawar. In 1814 it was engaged during the Kathiawar war at the capture of Beyt and Dwarka. In 1818 it saw service in Catch. Then followed the second expedition to Ras-al-Khaima, succeeded by further employment in Catch. Its last service was against the Beni-bu-Ali Arabs. General Sir Lionel Smith was subsequently Governor and Commander-in-Chief at Mauritius.

(To be continued.)

A SCHEME FOR COMPULSORY TRAINING IN INDIA.

BY CAPTAIN E. F. RUTTER, EAST LANCASHIRE REGIMENT,
ADJUTANT, POONA VOLUNTEER RIFLE CORPS.

More than one article has appeared of late in the pages of the *Journal of the United Service Institution of India* which can hardly have failed to be of interest to all readers who have the welfare of Indian volunteering at heart. I propose, in this paper, to touch on some further shortcomings of our present system, what the causes are that lead up to them, and show how, by the substitution of an entirely different scheme, they could be eradicated.

We will first take, what is perhaps the most important question of all, recruiting. Do we succeed under the present system in obtaining the services of the class of man who the country would expect to rely on in case of need? If not, then this system is a failure and some fresh one should be devised. Some corps may be more successful than others in this respect, but there is no doubt that the majority of Europeans throughout India will have nothing to do with volunteering, while even those that do join a corps are frequently volunteers merely in name. They have probably joined on account of some benefits that they hope to obtain thereby, and are content to do the minimum amount of work required of them, looking upon even this as a nuisance to be avoided if possible. This may be regrettable but it is hardly surprising. Volunteering, as such, from the point of view of recreation stands no chance whatever with tennis, hockey, cricket or any of the other pursuits dear to the heart of the man who has borne the burden and heat of an Indian day in office or workshop.

On the other hand it completely fails to touch his sense of duty or patriotism, for the simple reason that in time of peace, at any rate, the average Anglo-Indian has none. As regards recruiting then, the present system can hardly be considered a success. We will next turn to the method under which a volunteer is trained. As all who are acquainted with volunteering know the minimum of work required of a man in order to become efficient for the year is nine parades and a shooting course. These parades may be performed at any time during the drill season which usually lasts for some seven months in the year. The consequence is that long intervals may, and generally do, elapse between the performance of a half-hearted volunteer's attendances, and he has as a rule forgotten what he learnt at one parade by the time he appears at his next. Thus each time a comparatively fresh beginning has to be made, and he never becomes really efficient at anything beyond squad drill. It also means, as the year goes on, that those who have attended

them accordingly made a flank march on the 10th of February, and fell back to a new camp. They had, however, reckoned on a repulse after some sharp fighting, and sixteen men killed, and three wounded. The Brigadier, and twenty-three men were killed, three killed and wounded. The remainder moved to the main camp.

Transport having been procured, accompanied by sixty seamen of the Marine Battalion, started on March 11th. On the 13th the March arrived before the tribe's defences and advanced to give repeat their former tactics, charging with the bayonet and broad sword and target. Disregarding the loss of men, they fought with desperate valour in the line, with the fanaticism of the Indians. The British vainly attempted to break the dead line, but were repulsed; they, however, unsurpassed in the annals of the Indian wars, with one thousand warriors engaged, killed or wounded 1,200; and two hundred and sixty were wounded, were made prisoners. The attack was directed against the right brigade of the 65th Regiment and three hundred and thirty of the 6th Infantry and of the twenty-nine killed, thirty were wounded, three wounded, four killed and taken prisoner of the former, and twenty-two killed and wounded to the latter regiment. The fort was captured and the fort.

The 65th had played a distinguished part in the history of this period, much of it in combat. Its first services were during the Maratha expedition against the Joasmi reduction of Mauritius, followed by the capture of Nowanagar, in Kathiawar. In the Kathiawar war at the capture of Bey, service in Cutch. Then followed the capture of Khambhat, succeeded by further employment in the service was against the Beni-bu-Ali. Smith was subsequently Governor of Mauritius.

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been said to make out my case, viz., that the present training in India is unsatisfactory and some sweeping measure should be initiated to remedy its deficiencies.

I endeavour to explain a scheme, which, if it could be carried out, would overcome all these shortcomings, and would give a more efficient and stronger in numbers, far superior in efficiency and not a pice more expensive than that available at the present time.

If it is granted that a modified scheme of compulsory training is feasible in this country: whatever difficulties there may be in the way of such a scheme at home, they will be overcome here. There are no party votes to catch in the net. If the mandate were given, all individuals concerned would carry it out and make the best of it. This sounds utopian, but provided the measure was not unpopular, there would be no serious opposition. The scheme I propose then is the scheme I propose:—

CONDITIONS OF SERVICE.

18 days and a course of musketry.

12 ditto ditto.

6 ditto ditto.

He must be under the age of 36 before he has completed this course, and must not do so unless desirous of so doing.

REGISTRATION.

Every European British subject, on reaching his port of destination, shall be registered and allotted to a corps according to his place of residence.

Every person resident in the country to be registered in the country.

CORPS CONDITIONS.

Each corps shall be brigaded in groups of three, each group having a staff.

Each corps, except musketry, to be performed in three weeks' duration, held at different times of the year. The camps shall be outside these camps.

Each corps to arrange their camps so as to follow, consecutively, the three camps.

In Group A there are three corps 1, 2 and 3.

Corps 1 to hold its camps in October and January.

Corps 2 ditto November and February.

Corps 3 ditto December and March.

Each corps shall have the option of which of their corps camps they shall hold.

The staff and his staff move from camp to camp putting the work in turn. The work done will be thoroughly

regularly are constantly hampered by the presence of a number of half-drilled comrades, who are unfit to perform more advanced exercises and the work of the whole corps is retarded in consequence. This is especially felt in small corps where, even if all present were in the same state of advancement, a battalion parade would be difficult; it is now practically impossible, and anything in the shape of progressive instruction is quite out of the question. Reform then of some sort is urgently needed in the training of a volunteer as well as in recruiting.

Then there is the question of inspections. That held annually before the I. G. is probably as fair a test as it is possible to obtain. This officer having seen all the corps in India is able to compare one with another. He knows the peculiarities and difficulties of different corps and is well able to judge on their respective merits. The annual inspection before the G. O. C., or more often before some officer detailed by the G. O. C., to carry out this inspection is, however, frequently no test at all.

An Adjutant once remarked to me that inspecting officers were of two kinds. Firstly, those with but little knowledge of volunteers, but well disposed towards them and anxious to give them as good a report as possible. Secondly, those with but little knowledge of volunteers, but badly disposed towards them, who were inclined to take the opportunity of emphasising their opinions by enlarging upon every shortcoming that might come under their notice. A third class, *i.e.*, those who had some practical knowledge of volunteers, was so rare that it might be put down as a negligible quantity. That while even the worst corps, if inspected by one of the first mentioned class, would probably get a good report and all their shortcomings white-washed over, the very best corps, if inspected by one of the second class, would run grave risk of getting badly reported on and of having a keen season's work discredited. This is perhaps a somewhat exaggerated view to take. At any rate, fortunately for the volunteers, the class of inspecting officer first mentioned largely predominates. This fact, however, does not detract from the point of his argument, as it is obvious that an over optimistic report is just as misleading as one that may err on the side of severity.

Now as regards the *raison d'être* of the different corps in India. It is probably not too much to say that but few corps in this country have the vaguest idea of the part they would be called upon to play on an emergency, still fewer have any plan laid down to guide them in the performance of that part. The volunteer spends much of his too brief training in learning to advance in skirmishing order, and to attack impossible positions, which it is in the last degree likely that he would have to do on active service. Such practices as putting houses, posts, etc., into a state of defence, throwing up entrenchments or loopholing walls are seldom, if ever carried out. There would be no difficulty in citing many other disadvantages under which the present system labours, but I think

sufficient has been said to make out my case, *viz.*, that the present state of volunteering in India is unsatisfactory and some sweeping reform should be initiated to remedy its deficiencies.

I will now endeavour to explain a scheme, which, if it could be carried out, would overcome all these shortcomings, and would give India a force stronger in numbers, far superior in efficiency and personnel, and not a pice more expensive than that available at the present time.

I take it for granted that a modified scheme of compulsory service is possible in this country: whatever difficulties there may be politically and otherwise in the way of such a scheme at home, they effect this country but little. There are no party votes to catch in India, and if once the mandate were given, all individuals concerned would have to carry it out and make the best of it. This sounds somewhat autocratic, but provided the measure was not unpopular, as there is no reason to suppose it would be with a majority of Europeans in India, there would be no serious opposition.

The following then is the scheme I propose:—

CONDITIONS OF SERVICE.

Recruit 18 days and a course of musketry.

Next 5 years 12 ditto ditto.

Next 5 years 6 ditto ditto.

If a man reaches the age of 36 before he has completed this service, he need not do so unless desirous of so doing.

REGISTRATION.

Every European British subject, on reaching his port of disembarkation, to be registered and allotted to a corps according to his future place of residence.

Those already resident in the country to be registered in the same manner.

CORPS CONDITIONS.

Corps to be brigaded in groups of three, each group having one adjutant and staff.

The work of each corps, except musketry, to be performed in two camps, three weeks' duration, held at different times of the year. No work to be done outside these camps.

Each group of corps to arrange their camps so as to follow, consecutively, corps by corps.

For example in Group A there are three corps 1, 2 and 3.

Corps 1 holds its camps in October and January.

Corps 2 ditto November and February.

Corps 3 ditto December and March.

Members to have the option of which of their corps camps they like to attend.

The Adjutant and his staff move from camp to camp putting each through their work in turn. The work done will be thoroughly progressive.

All recruits arrive in camp on the first day. At the end of the first week they should be sufficiently advanced to be able to take their place in the ranks with the 12-day men who would arrive in camp at the beginning of the second week. At the end of the second week all these men would be sufficiently trained to be able to carry on their work in company with the 6-day men who would come into camp at the beginning of the third week.

Thus all ranks would be trained together in accordance with a certain fixed standard and would finish up their camp with an equal knowledge of their duties. Only one Adjutant and staff would be required for three corps instead of three as now; their duties, not necessarily being harder, as instead of attending a number of small parades for the benefit of men who may or may not turn up at any given time, all their parades would be at full strength and each corps would complete their work in six weeks instead of six months.

MUSKETRY.

Annual course as at present.

One month in the year allotted to each corps to carry out their practice, viz.—

No. 1 Corps April.

No. 2 " May.

No. 3 " June.

Adjutant and staff as before, pressed from corps to corps, practising each through in turn.

July-August September of each year.

Adjutant and staff as before, staying in corps the first 2 months, leave.

EXERCISES.

As at present, but the 12-day men to be put into the ranks of the 6-day men, and the 6-day men into the ranks of the 12-day men.

Each corps to be divided into 3 companies, each of 100 men, and to be drilled as follows.

Each company to be divided into 3 sections, each of 33 men, and to be drilled as follows.

Each section to be divided into 3 platoons, each of 11 men, and to be drilled as follows.

Each platoon to be divided into 3 squads, each of 3 men, and to be drilled as follows.

Each squad to be divided into 3 files, each of 1 man, and to be drilled as follows.

Each file to be divided into 3 ranks, each of 1 man, and to be drilled as follows.

Each rank to be divided into 3 files, each of 1 man, and to be drilled as follows.

Each file to be divided into 3 ranks, each of 1 man, and to be drilled as follows.

Each rank to be divided into 3 files, each of 1 man, and to be drilled as follows.

prefer service as an officer to serve in the ranks and there would probably be competition to obtain a commission.

REQUIREMENTS.

A preliminary examination and periodical examinations to test whether an officer is fit to continue as an officer or not, also for promotion.

Officers would have to remain in camp for the full three weeks, and if possible should attend both of their corps camps.

COST.

Much money would be saved by—

1. Eliminating bands, headquarter buildings and all other such institutions now used to entice the recruit to enter the corps.

2. Economy in camp, by running all messing, etc., according to a sealed pattern under Government supervision.

3. Fewer Adjutants and staff sergeants would be required, as each of these would manage three corps instead of one.

Besides the above the exemption tax would cover a good deal of the expense.

RAILWAY CORPS.

Railway Corps already have the advantage of being able to compel their employees to serve. Their training however labours under the same disadvantages as other units, that is to say, it is spasmodic and unprogressive. For many reasons however the above scheme would not be practicable in their case so that some other plan would have to be devised.

That there are many difficulties in the way of compulsory service in this country is undeniable, but when we consider what a great advantage it would be, not to India only, but to the whole empire to have a trained force of some 80,000 Europeans well drilled and able to mobilise in a short time, surely it is at any rate worthy of consideration. For not only would this force form a most valuable reserve in case of war in India, but in the event of complications elsewhere it would be the means of setting free a large portion of the regular garrison who might be sent to the scene of operations without endangering the safety of the country.

How different might have been the result of the South African war if India had been able to spare at the commencement of operations 15,000 men instead of 5,000.

All recruits arrive in camp on the first day. At the end of the first week they should be sufficiently advanced to be able to take their place in the ranks with the 12-day men who would arrive in camp at the beginning of the second week. At the end of the second week all these men would be sufficiently trained to be able to carry on their work in company with the 6-day men who would come into camp at the beginning of the third week.

Thus all ranks would be trained together in accordance with a certain fixed standard and would finish up their camp with an equal knowledge of their duties. Only one Adjutant and staff would be required for three corps instead of three as now: their duties not necessarily being harder, as instead of attending a number of small parades for the benefit of men who may or may not turn up at any given time, all their parades would be at full strength and each corps would complete their work in six weeks instead of six months.

MUSKETRY.

Annual course as at present.

One month in the year allotted to each corps to carry out their practice, *i.e.*—

No. 1 Corps April.

No. 2 „ May.

No. 3 „ June.

Adjutant and staff, as before, proceed from corps to corps putting each through in turn.

July, August, September—off season.

Adjutant and staff after furnishing reports, etc., free to go on leave.

EXEMPTIONS.

Any one, on payment of a tax in proportion to his income, *i.e.*, for a man earning Rs. 2,000 per mensem, tax of Rs. 500 per annum.

For a man earning Rs. 1,000 per mensem, tax of Rs. 250 per annum.

For a man earning Rs. 500 per mensem, tax of Rs. 175 per annum, and so on.

The proceeds of the tax to go towards defraying the expense of the force.

Government having the power to exempt any one they may think fit.

OFFICERS.

The examination for entry into the I. C. S., P. W. D., Forest, etc., should include a military test.

Every corps should include a certain fixed percentage of officers drawn from these departments.

The remaining officers would be drawn from the better classes of Europeans as at present.

There would probably be far less difficulty in obtaining officers than now, as, if it became compulsory to serve at all, most men would

prefer service as an officer to serve in the ranks and there would probably be competition to obtain a commission.

REQUIREMENTS.

A preliminary examination and periodical examinations to test whether an officer is fit to continue as an officer or not, also for promotion.

Officers would have to remain in camp for the full three weeks, and if possible should attend both of their corps camps.

COST.

Much money would be saved by—

1. Eliminating bands, headquarter buildings and all other such institutions now used to entice the recruit to enter the corps.

2. Economy in camp, by running all messing, etc., according to a sealed pattern under Government supervision.

3. Fewer Adjutants and staff sergeants would be required, as each of these would manage three corps instead of one.

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THE FIRST AFGHAN WAR, 1838-1842.

LECTURE GIVEN AT KOHAT BY MAJOR A. S. HAMILTON, 52ND
SIKHS, F.F. (MARCH 1907).

In attempting to deal with the subject of this series of campaigns, I shall not do more than give their story as an encouragement to a study of their strategy and larger tactics, in which should all be interested, for is it not possible that the scenes of campaigns may be identical with those of some future war? general principles which govern policy as well as these two lessons of the military art are eternal, and history may repeat in many phases and details of a future campaign in or near Afghanistan.

With politics and strategy generally we probably shall not have much to do, but many of us may some day be in a position to profit by the lessons of a former campaign, and, perhaps, learn something from the experience of others, which may help us to make the best of untoward circumstances, or at all events avoid some of the pitfalls towards which accidents in policy and strategy may lead us.

This lecture then is only intended to give a rough outline of the first Afghan War in the hope of stimulating an intelligent study of its details, which are narrated more fully in the official Handbook of Afghanistan, in the biographies of Nott, Pollock, Durand Broadfoot, and in various private journals, such as those of Hough, Stocqueler, Abbott, Eyre and Lawrence. Kaye's interesting history, by the way, is perhaps not quite accurate enough to be a reliable military record.

A short résumé of political events must first be inflicted on us.

Russia, in 1836, by the intrigues of her Minister at the court of the Persian Shah, had induced him to attack Herat, and had even gone to the length of sending a Russian envoy to Kabul by way of Kandahar. The British Government of the day had consequently one reason for not placing implicit confidence in the ruler of Afghanistan. They wished to constitute a buffer state against Russia under the rule of their own nominee, the deposed Shuja-ul-Mulk, a former Shah of Afghanistan, who had been ousted from his throne by the brother of his murdered Wazir. This brother was the capable and ambitious Dost Muhammad, who had taken the new title of Amir of Afghanistan.

With the assistance of Ranjit Singh, "the Lion of the Punjab," the British Government intended to establish a ruler in Afghanistan who should, on the one hand, be less inclined to trespass on the territory of the Sikhs, and, on the other, be more amenable to the

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wishes of the British Government with regard to concerted measures against the Russian threat. In a word, a ruler more aggressive on the Russian side and less so on the Indian side. This Utopian person the British Government appear to have sought continually with no success.

In aiding the claimant to the Afghan throne, the Sikh Maharaja hoped to re-establish his power which had been seriously threatened by Dost Muhammad on the Peshawar frontier. Shah Shuja was nominally to effect his own restoration backed up by British and Sikh troops; but, as will be seen, the contingents commanded by himself and his son formed a comparatively small part of the invading forces.

The conditions under which the invasion of Afghanistan was undertaken in 1838 were so different from those of the present day, and even from those of the 1878 war, that a brief digression must be made to explain them. The Punjab was independent and Sikh susceptibilities prevented a British army following the direct road to Kabul through Lahore and Peshawar. Apart from this reason for the choice of route a second was that which to the present day makes the southern the easier approach—the Afridis of the Khyber are by no means yet a negligible quantity in strategical problems of the day. Karnal, south of Ambala, was the most advanced cantonment, with outposts at Ludhiana and Ferozepur, on the then North-West Frontier. The Grand Trunk Road ceased at the former point and in advance of this outpost nothing but rough *kachcha* roads traversed the Punjab with primitive ferries across its great rivers. On the Bombay side our frontier was still more restricted. Deesa was the most advanced cantonment; whilst Karachi and the whole of the southern basin of the Indus belonged to the Amirs of Sind. Finally, the troops of each of the three Presidencies were under the control of their respective Governments with separate Commanders-in-Chief. Such, then, were the political and physical conditions which existed when war was decided upon.

Each of the two Presidencies of Bengal and Bombay furnished its contribution in fighting men and train, nominally as a support to Shah Shuja's own contingent, which he was personally to lead against Kandahar, whilst a second contingent under his eldest son, the Shahzada Taimur, was to be assisted by a Sikh force to thrust its way from Peshawar to Kabul. These two contingents—the Shah's and the Shahzada's—had been raised throughout Bengal and Oudh during the earlier months of 1838; and with the exception of a Gurkha battalion of the Shah's and a few Pathan irregulars in the Shahzada's contingent were of the same classes as our Bengal native cavalry and infantry. All the Infantry except the Pathan *jazailchis* carried smooth-bore muskets.

The Bengal troops in five brigades under the command of Sir Henry Fane, their Commander-in-Chief, assembled at Karnal at the end of October 1838 and were concentrated at Ferozepur with the Shah's contingent by the end of November. News was there

received by the Viceroy, who had joined the camp, of the raising of the siege of Herat and the consequent discomfiture of Russian designs. Nothing, however, would put Government off their plan of placing a puppet on the Afghan throne. The only alteration in the plan was to leave two infantry brigades and some cavalry and artillery behind at Ferozepur. With them, to his great relief, for he disliked the object of the campaign, remained Sir Henry Fane.

In December the Bengal troops marched down the left bank of the Sutlej, crossed the Indus at Sukkur and moved 26 miles to Shikarpur. Thither Shah Shuja and his contingent had preceded them, whilst his son's contingent and the Sikhs moved on Peshawar. (See Map No. 1.)

The Bombay troops had landed at Karachi in December, and following the right bank of the Indus reached Shikarpur just before the Bengal force. The combined forces which were then concentrated under the command of Sir John Keane, the Bombay Commander-in-Chief, were dignified by the name of "the Army of the Indus." The Bengal column was about 9,000 strong, the Bombay troops numbered nearly 6,000, and Shah Shuja's contingent added another 6,000.

Of the train of the Shah's contingent there is no reliable record, but the 15,000 regular troops of Bengal and Bombay had some 80,000 camp followers and about the same number of camels as transport besides many bullocks both as gun teams and in carts.

An order against excessive baggage and large establishments had been promulgated, but notwithstanding this precaution historians tell us that one officer of the 16th Lancers had 40 private servants; that one General Officer had 43 baggage camels, and it is said that some camels were loaded with as much as 14 maunds each! Such was the strangely equipped force that was now about to struggle across the deserts of upper Sind, up the Bolan Pass, and over the Khwaja Amran range to the plains of Kandahar.

On the 23rd February 1839 the Army began to move by dribblets from Shikarpur across the Kachi desert to Dadar. The followers were now put on half rations and the animals generally underfed. The Bolan defile was entered by the leading troops on the 16th March and Quetta reached by the advanced guard on the 20th. Eleven days were required to concentrate the whole force at Quetta and meanwhile owing to the scarcity of supplies, for the collection of which the Baluch Khan of Kalat had been relied upon, the fighting men were also put on reduced rations. At the end of March, when all had reached Quetta, grain for animals gave out altogether; luckily *khlasil* was obtainable.

After a week's halt, the advance continued. A cavalry regiment and two infantry battalions under General Nott were left at Quetta, the Bolan Pass being already held by a brigade.

The force which moved into Afghanistan was made up of about 10,000 Bengal and Bombay troops and 5,000 of the Shah's contingent. The British element consisted of 1½ British cavalry regiments,

4 battalions and 3 six-pounder Horse Artillery batteries. Some of the so-called "heavy" 18-pounder guns and 24-pounder howitzers were drawn by bullocks.

The Khojak Pass was crossed without incident, slides being made to let down the guns and transport carts, and finally Kandahar was reached unopposed on the 25th April by the leading troops with Shah Shuja who made a triumphal entry. The Governor of that city and his brothers had fled to Girishk without striking a blow.

By the beginning of May the Army was concentrated at Kandahar, but not without considerable loss to the animals which had suffered even more than the men from starvation. Twenty per cent of the cavalry horses had died between Shikarpur and Kandahar, which was not to be wondered at considering they had had no grain and very little *khusil* for nearly a month. The troops were not in much better plight, having also been on half rations for a month whilst of the 50,000 camels which had survived the Kachi desert and the Bclan Pass 20,000 only remained effective.

All things considered the first objective—Kandahar—was seized with commendable speed. Not quite ten weeks had elapsed since this unwieldy force had started from Shikarpur, and it was less than a month since the final advance from Quetta—a result which can compare favourably with the movements of the 1878 campaign.

As a consequence of the casualties in transport and the difficulties in supply, the Army remained practically immobile until the end of June. During these two months transport and supplies were collected locally under the restored régime. The surviving transport meanwhile was found sufficient to provide for a small flying column, 1,000 strong, which was despatched in May to Girishk to enforce the restored Shah's power and to expel Dost Muhammad's adherents beyond the Helmand river.

By the 27th June, sufficient transport and supplies to give the men half rations for a month having been collected, Sir John Keane moved towards Kabul with about 8,000 regular troops and half that number of the Shah's contingent, leaving two battalions, a few cavalry and twelve guns at Kandahar. The latter included the only four 18-pounder guns which had reached Kandahar. These, according to the political intelligence officers, would not be required against the fortifications of Kalat-i-Ghilzai or Ghazni which were, they said, despicable.

The followers of the reduced Army of the Indus were still numerous. There were 30,000 of them for the 8,000 regular troops; history does not relate how many accompanied Shah Shuja's contingent, but we may calculate that about 50,000 in all attended the 12,000 fighting men. The force marched along the high-way to Kabul the so-called "road" shown on the map. It had to move in four columns in successive days, owing to the length of its baggage columns. In 25 days this heterogeneous army with its slow-moving transport covered 21 marches, or 220 miles, and appeared before Ghazni on the 21st July, having concentrated, in anticipation of resistance, one march

short of that place. Sir Donald Stewart took only two days less to cover the same distance in 1880.

The fortifications of Ghazni were found to be much stronger than was expected. On the night of arrival a further move was therefore made to the north-east of the town preparatory to an assault. A reconnaissance, together with news received from an Afghan informer, disclosed the fact that there was only one vulnerable point—the Kabul Gate. This was blown in before dawn next morning and the breach entered by a storming party which headed an assaulting column led by the British battalions. Of the garrison of 3,500 nearly half were captured including the Governor, a son of Dost Muhammad, and almost all the remaining half were killed. On our side there were less than 200 casualties.

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Whilst southern Afghanistan was thus invaded and Kabul threatened from the direction of Ghazni by the main force under Sir John Keane, the secondary attack was in progress from the direction of Peshawar. This containing force, which held Dost Muhammad to Kabul and prevented him from helping Ghazni, consisted as before mentioned, of the Shazada's contingent and the Sikh supporting force.

The Shahzada's contingent numbered 4,000 ; some of them were recruited from the Pathan tribes of the Sikh frontier and armed with their own *jazails* which were longer ranging weapons than the Brown Bess carried by the remainder of the force. The Shahzada's contingent was stiffened by half a battalion and four guns of the regular Indian army. Ranjit Singh's force consisted of 12 guns and some 6,000 men of the Sikh army.

The 10,000 troops of the combined northern force were under the military, as well as political, control of Lieutenant-Colonel Wade, the representative of British India at the Sikh court. Concentration at Peshawar occupied some months, but a start was eventually made from Jamrud on the very day of the fall of Ghazni. Ali Masjid was seized from the Afghan troops after five days had been spent forcing the way step by step up the Khyber defile.

* * * * *

We may now turn from Colonel Wade and his force moving slowly forward towards Kabul from the east and again join Sir John Keane's army striking at Kabul from the south. Leaving a garrison of one Native infantry battalion and some irregular cavalry at Ghazni, the "Army of the Indus" moved again in two columns on the last two days of July, and, covering the 90 miles to Kabul by way of the Maidan district in nine days, reached the capital without further opposition on the 6th August.

Dost Muhammad did not await its victorious advance, but abandoning his guns fled across the Unai Pass after making a half-hearted attempt to rally his troops in Maidan. An attempt was

made to intercept his flight by 13 British officers and 250 Indian cavalry headed by Captain Outram, but, aided by the duplicity of their guide, the Amir reached Bamian by the Irak Pass and thence with a few trusty followers retired to Afghan-Turkistan.

Colonel Wade appeared at Kabul a month later.

Active opposition on the part of Dost Muhammad was now at an end and the country secured to Shah Shuja. There was therefore apparently no reason for keeping any except a small British force to help to consolidate his power. The Bombay column was accordingly despatched on its return journey to Quetta on the 18th September. The main road was left at Mukur, half way to Kandahar and a bee line taken across the southern Ghilzai country by Maruf to the Toba plateau with the treble object of making a demonstration in favour of Shah Shuja, exploring fresh country and exploiting new sources of supply. In six weeks' time the Bombay troops, unopposed during their march, were clear of Afghanistan.

The detachment at Kandahar, which General Nott had come from Quetta to command, was the only part of the original Bombay force left in the country. By the middle of October Sir John Keane also had quitted Kabul taking with him nearly all the cavalry and artillery of the Bengal column and half the infantry, thus leaving Sir Willoughby Cotton, who succeeded to the command, with two British battalions, the 13th Light Infantry and 1st Europeans, seven Native infantry battalions and two batteries of field guns, 9-pounders and 6-pounders. With the addition of the Shah's own forces these represented the total strength which the Government of India considered adequate to the task of maintaining Shah Shuja on the throne.

Several local Afghan regiments or levy corps were now raised and commanded by British officers as a political arrangement. The experiment, as we shall see, proved a dangerous one. Henceforward the peace of the country depended mainly on political efforts and we need not dwell long on these.

* * * * *

Sir William Macnaghten, the chief political officer, or Envoy as he was styled, now began his reign, for Shah Shuja was merely a figure-head. One of the first steps taken by the paramount political authority was to remove the troops from commanding positions such as the Bala Hissar, or fort of Kabul and bring them into a low-lying cantonment about a mile north-east of Kabul city, overlooked by the adjacent hills and surrounded by walled villages and enclosures. (See Map No. 2.)

The cantonment did not even include the magazine, the supply depôt or the treasury. The first was some way outside the cantonment, the second in a village a quarter of a mile off, whilst the treasury and pay-office were actually in the city itself.

As the winter came on, a move was made by the political and military headquarters to the warmer climate of Jalalabad.

There were minor expeditions during the autumn and winter up the Kunar valley north of Jalalabad and in the direction of Gardez, south of Kabul, their object being to enforce the rule of the restored king and punish recalcitrant tribesmen or those still favouring Dost Muhammad. To protect Kabul from any attempt made to approach it from the north detachments had been sent, immediately after its occupation, to Charikar and Bamian. No serious threat however as yet came from beyond the Hindu Kush where Dost Muhammad was ingratiating himself with the Uzbaks of Afghan-Turkistan and slowly collecting adherents.

The summer of 1840 passed quietly. The wives of British officers by permission of Government settled with their husbands in the new Kabul cantonment. But in September, a year after his forced abdication, Dost Muhammad began to make himself again felt. Our outposts beyond Bamian—at Saighan, Kamard and Bajgah—were threatened by him and had to be withdrawn to Bamian. The garrison there was then reinforced and internal disaffection removed by the disarmament of a local Afghan corps, many of whose members had already deserted to Dost Muhammad. Brigadier Dennie who was in command again pushed forward, defeated the enemy and occupied Saighan.

Dost Muhammad upon this moved by a pass further east across the Hindu Kush to Kohistan, and the centre of disaffection was consequently transferred to Charikar. Here Brigadier Sale was in command of a mixed brigade, which, like all detachments we read of, did not belie its name. It was composed of:—

The 2nd Bengal Light Cavalry.

A cavalry regiment of Shah Shuja's contingent.

About 800 irregular Afghan horsemen.

The camel battery.

Two guns of a battery of the Shah's contingent.

One 24-pounder howitzer and two mortars drawn by bullocks.

The 13th Light Infantry (British).

The 27th Native Infantry.

Two companies of the 37th Native Infantry.

On the 29th September Sale attacked a walled village near Charikar and defeated the enemy, but on the 3rd October was held up by a small hostile party which occupied another fortified village and inflicted a loss on the British of about 50 killed and wounded before escaping. Sale was then reinforced by the remaining six companies of the 37th Native Infantry and a section of field guns.

Against him came Dost Muhammad in person. On the 2nd November the ex-Amir with an advanced guard of 200 horsemen was being pushed out of the village of Parwan near Charikar when he turned on the pursuing 2nd Bengal Cavalry, who were out of reach of the supporting infantry. The Native Cavalry failed to follow their British officers, two of whom were killed together with the political officer and two more were wounded. When, however, the infantry

at length arrived they defeated the Afghan force with considerable slaughter.

This was Dost Muhammad's last effort to reinstate himself. Next day he rode into Kabul alone and gave himself up to the British Envoy. Along with Sir Willoughby Cotton he was escorted to India and there treated as a political exile.

Sir Willoughby's successor was General Elphinstone, who brought up the 44th Foot under Colonel Shelton to relieve the 1st Europeans.

* * * *

Now that the disturbing element in Afghan politics was removed from the arena, Shah Shuja apparently began to think that the sooner the British army left him to rule his country in his own way the better; or, if he personally did not consider himself strong enough to do so without the help of British bayonets, the Afghans as a whole, and the Durani Sardars in particular, resented strongly the continued military occupation, but most of all the political administration, of their country by aliens.

They argued—and, who will say they were not right?—that the British, under pretence of assisting the legitimate ruler to recover his rights, had secured the assistance of the loyalist party and, using that device to prevent united resistance, had seized their country against the opposition of the Dost Muhammad faction only.

* * * *

Signs of unrest began to show themselves early in 1841. The Alizai Duranis of the Zamindawar District near Kandahar, then as at the present day the most fractious of the tribe, were the first to disturb the peace.

The Kandahar garrison was therefore raised by the 1st March to a strength of 18 guns, one native cavalry and seven infantry regiments. Several small expeditions were made into Zamindawar, in some of which the Afghan levies on our side showed by their conduct that their sympathies were with their malcontent kinsfolk.

The Ghilzai tribesmen joined the general disturbance in April and tried to prevent the improvement of the ruined defences of Kalat-i-Ghilzai which had been occupied by a small detachment. Reinforcements sent to this outpost were attacked on the road but inflicted a loss of several hundreds on the enemy.

After some desultory fighting had occurred on the Helmand in August, General Nott, at the end of September, eventually suppressed the rising by an expedition which penetrated to Miran, about 70 miles north of Kandahar.

* * * *

To shift the scene again to northern Afghanistan where the inhabitants had remained quiet so long as Shah Shuja still continued to suffer the presence of his self-appointed protectors, and dared not as yet countenance open opposition.

Major Eldred Pottinger, who was the hero of the siege of Herat with which this lecture opened, arrived at Kabul as one of the political staff in May. He ventured to point out to the Envoy that the military strength was not adequate to the task of enforcing political demands. Proof of the soundness of this advice was soon forthcoming in the repulse of a small party sent to collect revenue near Gardez in August.

Punishment was meted out to these rebellious inhabitants of the Koshin district in September. The force consisted of two squadrons of Native Cavalry, 200 British and 1,000 Native Infantry, with six guns and some Sappers. They marched to Gardez dragging their guns over the Altimur Pass and back the same way, after effecting their purpose with practically no casualties.

This affair had no serious bearing on the condition of affairs at Kabul. That place and others in its immediate line of reinforcement were to the British vital strategic points.

The lines of communication between Peshawar and Kabul had all along been kept open by political or diplomatic methods, that is by paying blackmail to the guardians of the passes—Ghilzais, Khugianis and Afridis. The Indian Government were at this juncture ill-advised enough to reduce the northern Ghilzai allowances by Rs. 40,000. The immediate result of this fatal economy was the defection of the tribesmen of the Khurd-Kabul defile and Tezin valley. Through these gorges ran the only caravan route to India. The short cut over the Lataband Pass was not made until the second Afghan War.

The rising of the hill clans was secretly welcomed by Shah Shuja and openly by all the Afghan Sardars. The Shah himself continued to pretend to discourage the Ghilzais in their rebellion. He, however, was a mere cats-paw.

The annual movement into warmer winter quarters began early in October, and Sir Robert Sale was to march to Jalalabad with his own regiment, the 17th Light Infantry, 800 Native Infantry, the camel battery and a squadron of the 5th Light Cavalry, besides a few Sappers and other cavalry details.

He was attacked when moving with part of his force to Khurd Kabul, and being reinforced there by the remainder continued to be harrassed all the way to Tezin. Finally, after crossing the Jagdalak Pass, the rear guard was followed up in force as far as Gandamak. In these affairs 200 casualties occurred.

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Before narrating the principal events which took place at Kabul, a brief notice is required of the outbreak near Charikar. The Assistant of the political officer there, Major Pottinger, was a Lieutenant Rattray. One of a *jirga* of Kohistanis, summoned by the political officer to enquire into the defection of some Afghan levies, assassinated Lieutenant Rattray on the 3rd November. The post at Charikar to which the Political Staff escaped was then surrounded by some thousands of Kohistanis.

On the second day the water guard tower was surrounded through the treachery of the Afghan *munshi*. The Gurkha garrison of the post after suffering terribly from thirst, and losing two British officers and 200 of their number, attempted on the tenth day to cut their way out. Only Major Pottinger, the Adjutant and a Gurkha orderly escaped to Kabul with their lives; all the other British officers were killed and only 165 Gurkha survivors were eventually found scattered about the country as slaves. Two other British officers with the Kohistani levies were deserted by their men and murdered between Kabul and Charikar.

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The last and most tragic events now remain to be told.

General Elphinstone who had relieved Sir Willoughby Cotton in the previous April was, on account of his age and natural decrepitude, becoming daily more effete and disinclined to mental and physical exertion. These characteristics had not militated against his selection for the chief military command in Afghanistan.

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On the 2nd November the first act in the disaster of Kabul began.

It will be remembered that the treasury was in the city. This and the house of the Political Agent, Sir Alexander Burnes, close to it, were attacked by 300 malcontent Afghans, and he and two other British officers were murdered and the treasure looted. No attempt was made to succour these officers and, their unavenged massacre was the signal for the rising in arms of the whole Afghan population. The only steps taken were to bring in the troops at Khurd Kabul and on the Siah Sang to the cantonment, and to occupy the Bala Hissar with a fairly strong force.

Thirty-six hours after Sir Alexander Burnes' murder the supply depôt, being like the treasury some distance away, was cut off from the cantonment. Its evacuation was then ordered by General Elphinstone against the protest of many officers. An attempt made

to relieve its small garrison was repulsed with the loss of six British officers killed and wounded besides many men. Eventually after a two days' siege the young officer who commanded, acting on his orders, fought his way back to the cantonment.

During the two succeeding days futile attempts were made to recapture the supply post or at all events prevent the Afghans making off with its contents. By the 8th November nearly all the available supplies in the cantonment were exhausted.

On the 11th November, Brigadier Shelton, the second-in-command, with half the garrison of the Bala Hissar was recalled to the cantonment to support the General physically and morally. He was in favour of an immediate retirement towards India. The enemy now, creeping closer to the cantonment, occupied a fortified village not a quarter mile distant from which they were ousted by Shelton and three battalions with a loss of three British officers killed and 200 other casualties. This somewhat relieved the pressure and a few supplies were secured.

On the 13th the enemy mounted two guns on the Bemaru ridge half a mile from the cantonment, and these had to be dislodged. Shelton was again employed with a considerable force and succeeded in his object.

A week later Muhammad Akbar Khan, the most vigorous of Dost Muhammad's many sons, arrived with a numerous following at Kabul from Afghan-Turkistan, and the next day occupied the Bemaru ridge. Shelton made a third sortie with two battalions, three squadrons and a single gun and seized the hill before dawn; but he was unable to hold it. After being assailed on all sides throughout the day, the force retired in confusion to the cantonment leaving behind about 200 dead and the gun.

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Two days before Christmas Sir William Macnaghten was inveigled by Muhammad Akbar into a further parley regarding an assisted retirement; he was then treacherously murdered within 500 yards of the cantonment and his remains submitted to every indignity. This outrage could not be avenged by the helpless garrison. General Elphinstone remained supine, nor could he make up his mind to any action, though urged once more by Major Pottinger to seize the Bala Hissar.

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On the 6th January 1842 began the disastrous retreat, the details of which I have not time to recount.

A few wounded left in Kabul were protected by Muhammad Akbar; but of the 4,500 fighting men and nearly 12,000 followers besides women and children, who marched, all were killed or perished from exposure except a few natives who remained as slaves in Afghan hands, and the 40 British prisoners who included the General, Ladies Macnaghten and Sale, 16 officers, mostly wounded, and their families. Doctor Bryden alone of the whole force reached Jalalabad after seven days and nights of terrible experiences

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Sir Robert Sale meanwhile had been continually threatened at Jalalabad, where his Engineer, Captain Broadfoot, had marvelously improved the defences. Reinforcements from India were anxiously awaited and when the news reached Jalalabad of the failure of the first attempt to force the Khyber, Sale called a council of war to consider the orders which the Afghans had induced Macnaghten to issue. Only three officers formed the minority against any surrender. Fortunately negotiations were not brought to a maturity.

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The first of Pollock's troops indeed had reached Peshawar two months earlier, but they were not sufficient either in strength or moral to force the Khyber till April. His army by that time consisted of the 3rd Light Dragoons, the 9th Foot and a British Heavy Artillery Battery, five Native Cavalry regiments, eight guns of the Native Artillery and about 4,000 Native Infantry belonging to eight different units with the usual complement of Sappers and Miners. Besides these were 400 Pathan *jirafdar* and a large Sikh contingent which is said to have numbered over 24,000 men with 20 guns.

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In February by the terms of Macnaghten's treaty the evacuation of Kandahar was demanded by Akbar Khan. General Nott's situation being a strong one he naturally refused, and replied by clearing Kandahar of all suspected inhabitants. He then made several successful sorties against the Afghans which would have been still more effective but for the paucity of his cavalry. Anxious to move north, he called for reinforcements from Quetta and after considerable persuasion General England, who commanded there, moved with his brigade towards Kandahar being helped over the Khojak by another brigade sent to meet him from Kandahar. The garrison of Kalat-i-Ghilzai was now hard pressed by the Ghilzais, and its relief was arranged for by the despatch of a mixed brigade, but Colonel Wymer and his brave garrison had already caused the raising of its siege by successfully repulsing a most determined assault six days before the relieving column arrived. It was here that the Shah's 3rd Infantry, which formed two-thirds of the tiny garrison, earned the title of "the Kalat-i-Ghilzai Regiment" and a place in the regular army as the 12th Native Infantry. Relievers and relieved not being strong enough to remain at Kalat-i-Ghilzai were withdrawn to Kandahar.

No orders could be elicited by General Nott from the Indian Government permitting an advance on Kabul until early in August, when the Viceroy eventually gave a half-hearted approval in the form of private instructions permitting Nott to *retire* from Kandahar by way of Ghazni and Jalalabad. So tied were the Viceroy's hands by the Home Government that he dared not publish orders for aggressive movements.

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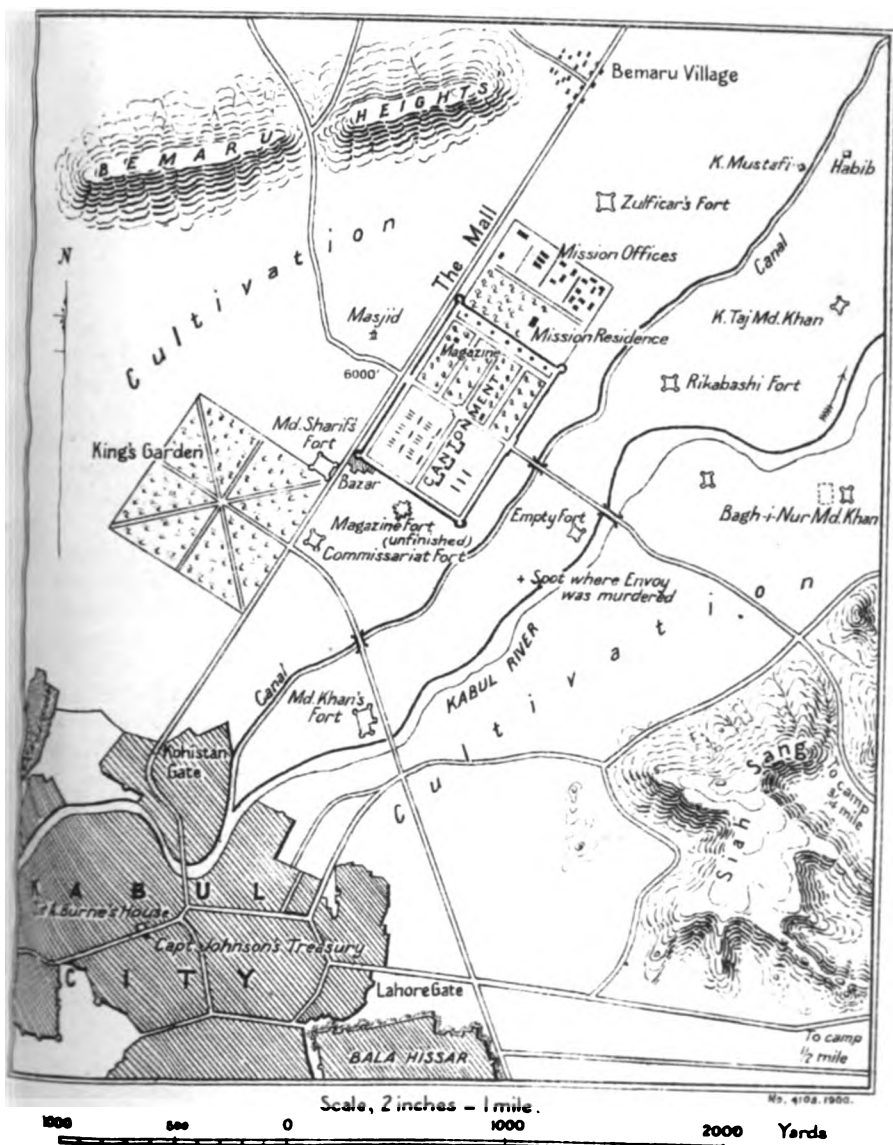
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On the 20th August Pollock, having communicated his intentions to Nott, moved the combined force 8,000 strong with 17 guns towards Kabul. At Gandamak he halted to get news of the Kandahar column, and, leaving a detachment with a supply depot there, he forced the Jaghdak Pass against some opposition on the 8th September. Tezin was reached on the 11th and, during the next day's halt to rest the transport, the camp outposts were attacked by Muhammad Akbar's forces.

On the 12th the Afghans were rash enough to stand and bar the British advance in strength on the watershed between Tezin and Khurd Kabul. Though double the strength of Pollock, Muhammad Akbar was completely defeated and his forces scattered with a loss to the British of only about 160 killed and wounded.

As the avenging army pushed its way through the Khurd Kabul gorge ghastly traces of the tragedy of January were visible on every side. The skeletons of the victims had to be cleared from the track to allow of the passage of the field guns.

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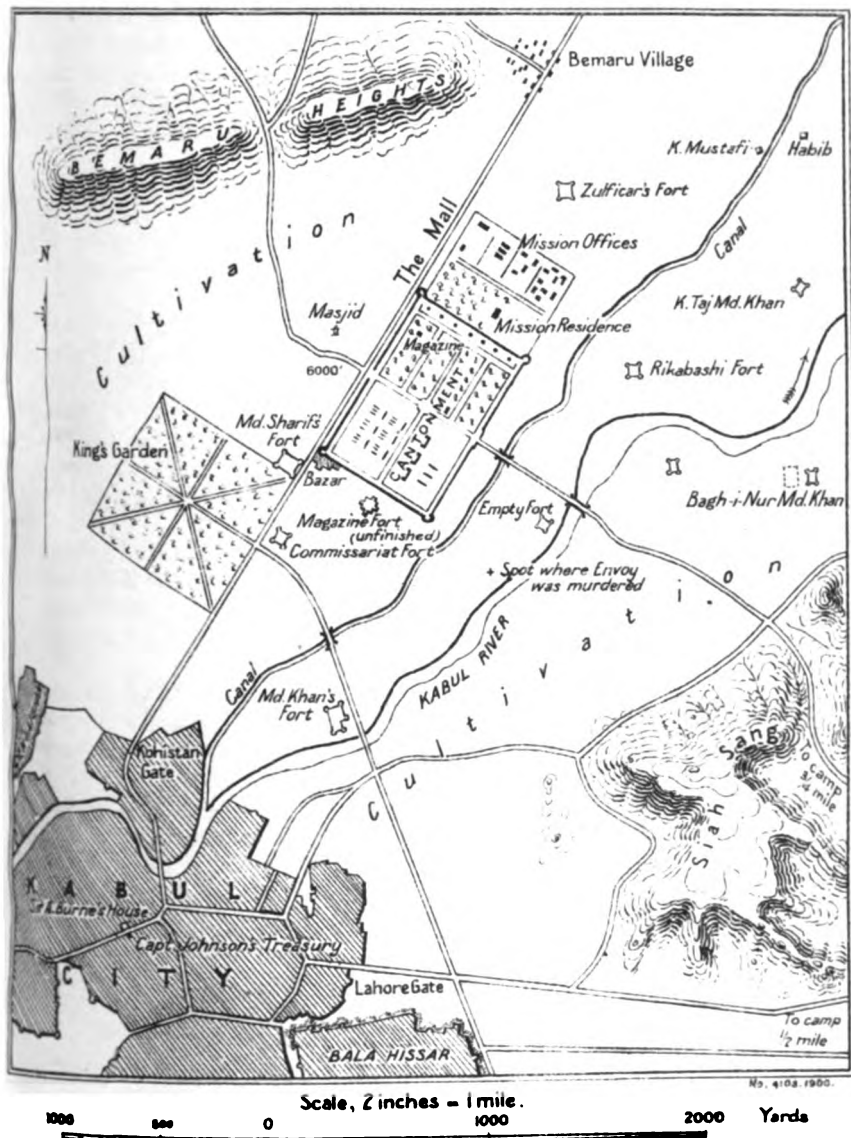
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destruction of the covered bazar in Kabul city where Sir William Macnaghten's remains had been exposed.

On the 12th October began the return march of the united columns. The movement is only of interest for the ingenuity with which the large force was marched with considerable speed over infamous roads. No fighting occurred until the Khyber was reached and here as usual only the rear guard was harrassed by the Afridis.

One month after leaving Kabul all had reached Peshawar and the First Afghan War was over.

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The only moral which I would venture to point is contained in almost the last recorded words of General Elphinstone, who died in captivity. He wrote:—

"I was unlucky in not understanding the state of things—and being wholly dependent on the Envoy and others for information." *

* "The Kabul Insurrection," by Sir V. Eyre.

THE FIRST GREAT CAVALRY GENERAL.

BY MAJOR D. S. BUIST, 29TH LANCERS.

I think if any of us were asked to name the first great cavalry leader, he would have little hesitation in mentioning the name of Hannibal. The theme of the exploits of the great Carthaginian is an old story, but it is a story that can never die of age; it must ever exercise a powerful fascination on the minds of men. Of all the great Captains he was the greatest; he had the mind to conceive, and the ability to carry through enterprises bordering on the impossible, and after a lapse of 2,000 years the world is still filled with wonder at the astounding genius of the man. But there were Generals before his day who well understood how to use the mounted arm, and we have only to cite the exploits of Alexander's 7,000 horsemen at Arbela, to show how well they were handled. Arbela was in great measure a cavalry fight, though mounted men formed a relatively small proportion of the forces engaged. Although the Persians vastly out-numbered the Macedonian levies, the superior discipline and training of the latter, together with their better tactical handling gave them the victory. Especially was this true of the cavalry, for whereas the barbarians fought in confused masses, with great bravery but with little order, or cohesion, the Greeks had organised their forces into units, which were able to manœuvre, and render each other mutual support. As it was in the days of Alexander, so it must ever remain—"Two Mamelukes," said Napoleon, "were able to make head against three Frenchmen, but 1,000 Frenchmen could easily put to rout 1,500 Mamelukes, such is the influence of tactics, order and evolution."

In the earlier wars we find that chariots were always associated with horsemen, much as at the present time horse-artillery completes the cavalry brigade, and the 300 scythe-bearing chariots that Darius put in the field, were by no means the useless encumbrances we are apt to think them. Given suitable ground for their use—such as the vast plains which stretch between the Tigris and the mountains of Kurdistan, they formed a dreaded weapon of offence, which fact all who remember their "Caesar" can well appreciate. Their tactical use was to create unsteadiness in the ranks against which they were driven, and squadrons of cavalry followed close upon them, to take advantage of the confusion they created.

After the death of Alexander the systematic use of cavalry seems to have been neglected, till its glories were revived by Hannibal at the battles of the Ticinus and Trebbia. The Romans were not slow to take their terrible lessons to heart, and in later years the mounted branch became their most highly prized and popular service. But the making of a cavalry soldier requires time, and it was not till

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The last act in the drama now opens.

General Pollock's instructions from the Viceroy, received at Jalalabad, were equally with Nott's extremely guarded. Kabul was not mentioned as his objective nor was specific permission given to go beyond his original orders to confine himself to the release of the prisoners.

On the 20th August Pollock, having communicated his intentions to Nott, moved the combined force 8,000 strong with 17 guns towards Kabul. At Gandamak he halted to get news of the Kandahar column, and, leaving a detachment with a supply depôt there, he forced the Jagdalak Pass against some opposition on the 8th September. Tezin was reached on the 11th and, during the next day's halt to rest the transport, the camp outposts were attacked by Muhammad Akbar's forces.

On the 12th the Afghans were rash enough to stand and bar the British advance in strength on the watershed between Tezin and Khurd Kabul. Though double the strength of Pollock, Muhammad Akbar was completely defeated and his forces scattered with a loss to the British of only about 160 killed and wounded.

As the avenging army pushed its way through the Khurd Kabul gorge ghastly traces of the tragedy of January were visible on every side. The skeletons of the victims had to be cleared from the track to allow of the passage of the field guns.

On the 15th September Kabul was reached and the British prisoners, who had by this time effected their own release, were met two days later by a mounted force which went out to assist their escape.

Two days later Nott's Kandahar column marched into camp on the other side of Kabul. He had covered the 310 miles from Kandahar in less than six weeks, fighting many skirmishes and one general action on the road.

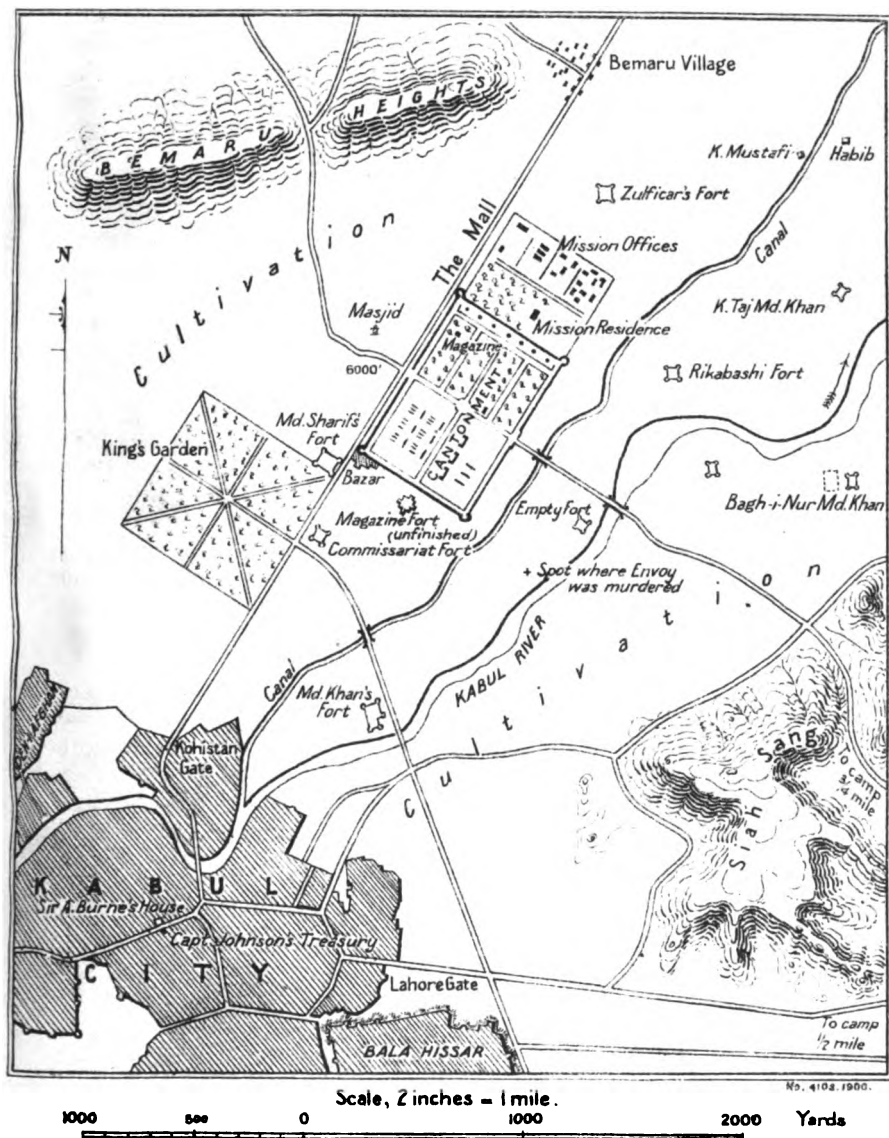
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There now only remained retributory measures at Kabul and punishment for the treachery of the Kohistanis at Charikar.

An expedition to the latter place avenged the massacre of its garrison and released many of the Gurkhas found as slaves in the district.

At Kabul punishment was not meted out to the Afghans themselves. The expiation of their crimes was exacted in the

PLAN OF BRITISH CANTONMENT AT KABUL AND ENVIRONS.



destruction of the covered bazar in Kabul city where Sir William Macnaghten's remains had been exposed.

On the 12th October began the return march of the united columns. The movement is only of interest for the ingenuity with which the large force was marched with considerable speed over infamous roads. No fighting occurred until the Khyber was reached and here as usual only the rear guard was harrassed by the Afridis.

One month after leaving Kabul all had reached Peshawar and the First Afghan War was over.

* * * * *

The only moral which I would venture to point is contained in almost the last recorded words of General Elphinstone, who died in captivity. He wrote:—

“I was unlucky in not understanding the state of things—and being wholly dependent on the Envoy and others for information.” *

* “The Kabul Insurrection,” by Sir V. Eyre.

THE FIRST GREAT CAVALRY GENERAL.

BY MAJOR D. S. BUIST, 29TH LANCERS.

I think if any of us were asked to name the first great cavalry leader, he would have little hesitation in mentioning the name of Hannibal. The theme of the exploits of the great Carthaginian is an old story, but it is a story that can never die of age; it must ever exercise a powerful fascination on the minds of men. Of all the great Captains he was the greatest; he had the mind to conceive, and the ability to carry through enterprises bordering on the impossible, and after a lapse of 2,000 years the world is still filled with wonder at the astounding genius of the man. But there were Generals before his day who well understood how to use the mounted arm, and we have only to cite the exploits of Alexander's 7,000 horsemen at Arbela, to show how well they were handled. Arbela was in great measure a cavalry fight, though mounted men formed a relatively small proportion of the forces engaged. Although the Persians vastly out-numbered the Macedonian levies, the superior discipline and training of the latter, together with their better tactical handling gave them the victory. Especially was this true of the cavalry, for whereas the barbarians fought in confused masses, with great bravery but with little order, or cohesion, the Greeks had organised their forces into units, which were able to manœuvre, and render each other mutual support. As it was in the days of Alexander, so it must ever remain—"Two Mamelukes," said Napoleon, "were able to make head against three Frenchmen, but 1,000 Frenchmen could easily put to rout 1,500 Mamelukes, such is the influence of tactics, order and evolution."

In the earlier wars we find that chariots were always associated with horsemen, much as at the present time horse-artillery completes the cavalry brigade, and the 300 scythe-bearing chariots that Darius put in the field, were by no means the useless encumbrances we are apt to think them. Given suitable ground for their use—such as the vast plains which stretch between the Tigris and the mountains of Kurdistan, they formed a dreaded weapon of offence, which fact all who remember their "Cæsar" can well appreciate. Their tactical use was to create unsteadiness in the ranks against which they were driven, and squadrons of cavalry followed close upon them, to take advantage of the confusion they created.

After the death of Alexander the systematic use of cavalry seems to have been neglected, till its glories were revived by Hannibal at the battles of the Ticinus and Trebbia. The Romans were not slow to take their terrible lessons to heart, and in later years the mounted branch became their most highly prized and popular service. But the making of a cavalry soldier requires time, and it was not till

long after the days of the great Carthaginian, that the Roman cohorts contributed so conspicuously to make their country Mistress of the World.

Carthage was originally neither the most ancient nor the most powerful of the maritime colonies which the Phœnicians planted on the coasts of Northern Africa, but the commercial and political energy of her citizens gave her the ascendancy over all her rivals. The empire was in many ways a prototype of that of Venice, and not the least was it so in the composition and organization of its armed forces. Though thirsting for extended empire, and though some of the principal citizens became Generals of the highest order, the Carthaginians, as a people, were anything but personally warlike. In the earlier days of the colony their leaders, like those of the Persians, seem chiefly to have relied on numbers, and showed little military skill. It was not till the time of Hamilcar Barca that their army became an organised fighting unit. Recruited as it was from Libya and Numidia, from Spain, Gaul, and Greece without any bond of origin, religion, or patriotism, it was a mercenary force in every sense of that term. The chief commands however were assigned to Carthaginians, and to induce them to take to a military career, motives of honour were held out, each citizen wearing as many rings as he had served campaigns. Although service in the cavalry seems chiefly to have attracted the upper classes, there was in every army a "corps d'élite" of footguards, called the "sacred band," formed from men of position, who were distinguished for the lavish splendour of their dress and accoutrements. The admirably efficient Numidians, of whom I shall have so often to speak, formed the predominant element in the Carthaginian cavalry. They were raised, as their name implies, from the nomadic and independent tribes who dwell in tents on the borders of the African deserts. Mounted without a saddle,* on small active horses, so well trained as not even to require a rush halter, which formed their only bridle; armed with a long lance, with a sharp pointed iron head, equipped with a piece of elephant hide for shield, and a lion skin for dress and bed; rapid alike in the charge, pursuit and rally, they formed an ideal irregular mounted corps. Another body of horsemen was recruited from the Libyans, a subject race who dwelt in territories surrounding the city, while both Spain and Gaul contributed small contingents of mounted men to the army of Hannibal.

"Military genius," says Lord Wolseley, "is composed of a greater variety of talents, and of natural gifts, than that which has made men great and renowned in any other walk of life," and we have to consider, but for a moment, the lives of Hannibal, Cæsar, and Napoleon to be convinced of the truth of this remark. It is, however, of Hannibal as a soldier only that I must speak, and surely never was one so successful against so many opposing difficulties. To a

* Saddles were not used till early in the fourth century, and stirrups were introduced by the Franks about the middle of the fifth century.

remarkable degree he possessed all the attributes of an ideal leader. His magnetic influence attracted to his standards races of all climes and nationalities, whom his consummate genius transformed into a devoted army that for 15 years bade defiance to the Imperial power of Rome. He possessed a moral ascendancy over the minds of men, and by appealing to their passions, imaginations, and affections, aroused a martial spirit that no hardship, disaster or misfortune could exorcise. For steadfastness of purpose, for organizing capacity, and as a master of the art of war, he has never had an equal. Never has any General excited so personal an attachment amongst his soldiers; no mutiny ever disgraced his armies, no panic ever seized the rawest of his levies, no factions disintegrated his heterogenous hordes, no assassin ever attempted his life, though urged thereto by the perfidy of Rome. He had not, like Alexander, like Cæsar, like Napoleon, an armed nation at his back, but he had a genius greater than these. Judged by the standards of his age his humanity is not his least distinguishing characteristic. Reared in camps from his earliest childhood, amongst an alien and barbarous people, his innate chivalry is all the more remarkable. In the hour of victory he was generally magnanimous. His treatment of the Roman allies who fell into his hands, was beyond all praise, though doubtless influenced by political motives. No such reservation, however, can be made in the credit we give him after his crowning victory at Cannæ. From amidst the heaps of slain he sought out the body of the vanquished Consul, and honoured it with obsequies becoming the dignity of one of the first magistrates of Rome. Nor does this deed of generosity stand alone, for he similarly honoured the bodies of Marcellus, the most successful of his opponents, and of Tiberius Gracchus, one of the noblest of the Romans, after he had defeated and slain them in battle. When we compare this conduct with the savage brutality of Nero, who after his victory at the Metaurus, ordered that the head of Hasdrubal should be carried two hundred miles, and then thrown into his brother's camp, we shall not fail to appreciate how favourably Hannibal compares with the noblest Roman of that age. To allow that his conduct did not always conform to the highest modern ideals, is to admit that he was human, but to credit the calumnies of Roman historians is to ignore the spirit of all criticism. He has no apologist from amongst his own countrymen, it is from his enemy's we judge him, and even from these he won a grudging esteem. They relate that upon occasions he slaughtered many of his captives, that upon the Roman refusal to ransom any of the prisoners who had fallen into his hands at Cannæ, he was guilty of grave excesses. The fact that after this crowning victory he sent to Carthage three bushels of gold rings, which had been taken from the fingers of 560 Knights slain in the battle, is a small matter, when we consider how inadequately his great enterprise was supported by his government, and how much this meant to the moral and material welfare of his army, by bringing home to his countrymen the reality of his

victory. It has been well said that Hannibal was greater than Carthage, that great as was the Roman senate, the Roman people was still greater. It was their steadfastness, constancy, and patriotism in the darkest hour of disaster that saved the State. But all that we can urge in praise of the Romans, redounds still more to the glory of Hannibal. The odds against him were impossible, it was one man fighting a consolidated and patriotic people, and though the end was defeat, two thousand years of criticism have never attributed this as a fault to the vanquished.

Although we have recently witnessed the conclusion of one of the most epoch-making campaigns in the world's history, in which many leaders have proved themselves men of the greatest capacity and skill, it is a somewhat remarkable fact that none is pre-eminently distinguished above his fellows. From the earliest times to the close of the XIX century, war has been the apotheosis of the individual, but whether it be that the military genius of Japan is impersonal, and lies more in a combination of infinitely careful efforts, than in the dazzling brilliancy of a single man, or whether it be that the circumstances of modern warfare are such as to forbid the avatar of another Hannibal, time itself can only show. Though twenty centuries have passed away since the defeat of the great Carthaginian we have been reminded that the great struggle, in which he bore so strenuous a part, still continues. It is a war of all the ages, this eternal conflict between East and West; before it all others sink into insignificance; its battle fields are scattered over three continents, its Generals are of every race and creed, its historians of all languages and times. It began before the siege of Troy, and will outlast the fall of Port Arthur. To lead its van has been the dream of the world's greatest conquerors, to stem its flood has fallen to the lot of all peoples.

In the annals of Carthage the fame of Hamilcar has only been eclipsed by that of his more illustrious son. The father was a soldier and statesman of the first order, who long foresaw that a desperate struggle for the mastery of the world must take place between the Romans and Carthaginians. He consequently devoted all his talents to the task of preparing for the impending conflict. After consolidating the Carthaginian dominions in Africa, and re-organizing the army, he determined upon the conquest of Spain. This country, he thought, would be a good base for his projected campaign against the Roman empire, here he could find material for an army, and ample means of providing it with pay. If he could only gain the confidence, and attract to his services, the hardy peoples of Iberia, he would feel in a position to carry out his great design for the invasion of Italy. For it must not be forgotten that the foundations of Carthaginian greatness rested on a purely mercenary army. But before maturing his ambitious schemes he fell in battle, and it was not till eight years later that his famous son was prepared to accept the legacy bequeathed him by his father. Hamilcar, long before his death, had succeeded in impressing upon him his convictions and

beliefs. His ruling passion had ever been an intense hatred of Rome, and, as a boy, he had caused his son to swear, at the altar of the chief Carthaginian deity, an eternal enmity to the Romans. That vow determined his life, when, at the age of 26, the whole army acclaimed him their leader. He was already known as a skilful and experienced General, who had successfully conducted many minor expeditions. As a cavalry leader especially he had made his mark, and was well trusted and believed in by the soldiers amongst whom he had been brought up from his earliest childhood. He now set himself the task of carrying out his father's long-cherished plans, but much had to be done, and three long years were spent in preparation. His army was at last well inured to war, while his treasury was full with the produce of the Spanish silver mines and the spoils of many a Roman garrison. All was ready, for he had sent embassies into Gaul and beyond the Alps, to seek the assistance and co-operation of the inhabitants of these countries. At last the die was cast, and in the spring of 218 B.C. he set out from New Carthage on his great enterprise. He would take with him none but daring and resolute volunteers, and before crossing the Pyrennees he sent back to their homes, all who faltered or held back, or whose hearts he felt were not wholly with him.

He met with little opposition on his march through Gaul, but the barbarians opposed the passage of the Rhone. He thereupon sent his Numidian Horse and some light armed troops under Hanno, a well tried leader, on a night march, to a point 25 miles up the river, where a sluggish current, wooded banks, and convenient islands, concealed and facilitated a crossing. The further bank was here unoccupied, and the operation was successfully accomplished, it is said by swimming the horses across the stream, unobserved by the enemy. The force then rested for twenty-four hours and the following night continued its march southwards. At dawn it reached a small hillock, visible from the main Carthaginian camp. Here it had been arranged a fire should be kindled, as a signal that all was ready. As the cloud of smoke rose into the air, Hannibal at the head of a small fleet put off from the western shore. The Gaulish hosts, on the further bank, stood ready to receive him, too occupied in shouting out words of defiance and hurling their darts at the approaching boats, to pay any attention to their flanks. This was Hanno's opportunity. With a shout the Numidians dashed rapidly forward, enveloped the enemy's right, and bore down all before them. The surprise was complete, and before nightfall the whole Carthaginian army was safely on the further shore. Hannibal now summoned his allies from amongst the Gauls to meet him, whilst his army continued its march northwards, under the direction of the guides with whom he had been furnished. But hearing that the elder Scipio had been ordered to Gaul to oppose his passage through that country, and that he was actually then in the neighbourhood of Massilia, 500 Numidians were immediately despatched to reconnoitre in that direction. The Roman General had under-

estimated the mobility of the Carthaginian, and had been halted some days near the mouth of the Rhone when the news of Hannibal's movements reached him. Pressing rapidly forwards he soon met the Carthaginian horsemen, who fell back before him, but he was unable to bring his army to the scene of the passage, till three days after Hannibal had quitted it.

Pursuit was useless in a hostile country, and Scipio decided to retrace his steps, and to meet the invaders on their arrival in Italy.

The route of the Carthaginian army now lay along the left bank of the Rhone to the town of Valence, from thence it was continued up the valley of the Isère, to the headwaters of that river. It then crossed the Alps, it is supposed, by the Little St. Bernard Pass, and entered Italy by the valley of Aosta. Five months were spent on the march, and of the 59,000 men who had actually left Spain, only some 26,000 reached the promised land. A contemptible force indeed to pit against the 770,000 legionaries of Rome and her Italian allies!

The Consul Scipio had arrived from Gaul and was now in command of the Roman troops at Placentia. Although numerically deficient and short of cavalry he boldly advanced up the valley of the Po to meet the invaders, and on the banks of the Ticinus was fought the first engagement in the second Punic war. It was appropriately enough essentially a cavalry action, and the inferiority of the Romans in this arm was decisively proved. They were driven back with heavy loss, and Scipio declining to risk his infantry in a pitched battle, was forced to retire on his base at Placentia, leaving the rivers Ticinus and Po between himself and the victors. The Numidian Horse followed hard at his heels, to dispute if possible the passage of these streams, but the Consul had retired rapidly, and had crossed both rivers before he was overtaken. The pursuit, however, was not altogether fruitless, for the Carthaginians succeeded in cutting off and capturing a force of 600 men, whom Scipio had left to destroy the bridge he had himself constructed over the Ticinus.

The Roman commander wounded and much dejected by his rout in the first skirmish, here awaited the arrival of his colleague, who, at his urgent request, had been ordered to his support from Rimini. But Hannibal had anticipated this movement, and had taken up a position on the Trebbia to cover Placentia, and to prevent, if possible, the junction of the two armies. The march of Sempronius, however, was so well conceived and so ably executed that he gave the Carthaginian no opportunity of acting against him, and the union of the Roman armies was successfully accomplished, almost under his very eyes. The combined forces numbered about 45,000 men; to this Hannibal, with his Gaulish allies, could oppose but 37,000. The armies now faced each other on opposite banks of the Trebbia, at a point some distance above its junction with the Po.

There were two parties in the Roman camp, the one counselled delay, the other urged immediate action. Of the proceedings of both Hannibal was well aware, and since his very existence in Cis-Alpine Gaul depended on an early and decisive victory, he resolved by the skilful use of a stratagem to force the hands of the Romans. A small and open plain that lay to his front seemed to offer conditions admirably adapted to the offensive action of his cavalry, and a little stream that meandered through it, and whose banks were covered with thick bushes, brushwood and weeds, appeared to suggest itself as an ideal spot for an ambush. But the enemy must be induced to cross the river.

It was December, and a foggy sky and inclement weather ushered in the morning of the day of battle. Hannibal, like Alexander at Arbela, ordered that his men should sup, he had reconnoitred the enemy, he had matured his plans, he now meant to draw the Romans into an immediate battle. Knowing the ambitious and impetuous character of the Consul Sempronius, he skilfully induced him to assume the offensive. To this end a corps of Numidian Horse was sent across the river, to threaten the Roman camp. They were opposed by the enemy's cavalry and light armed troops, before whom they gradually retreated, disputing the ground as they fell back. The Romans followed them up too eagerly, till, finally, Sempronius and his whole army were committed to a general engagement. A swollen river separated the combatants, but the Romans, undaunted by a storm of blinding sleet, plunged into the flood, forded the stream, and rushed impetuously forward to assault the Carthaginian position. To the Roman commander, the dispositions of the enemy seemed apparent—to his front he saw their army drawn up in a single line, with mounted men on both flanks, and their lightly armed skirmishers falling back before his advancing legions. This was all that met his eye; all he appreciated in the tactical situation. The name of Hannibal was not yet feared in Italy, and the Consul judged it an easy task to break through the thin and attenuated line of his enemy. The skill of the Carthaginian had thus induced the Roman to accept battle on ground not of his own choosing, and with no definite plan of action. With a flooded, and still rising river in rear, defeat spelt disaster to the Roman arms. The genius of Hannibal had anticipated every movement of his adversary, and his plans had proved so completely successful that he now felt prepared to launch that vigorous offensive movement he had so carefully prepared. For before dawn he had placed his brother Mago in ambush under cover of the steep banks of the little Trebiola, with orders to remain concealed till such time as he should receive the signal to attack. The Romans had crossed the river, their cavalry had been dispersed, their infantry was now hotly engaged, the psychological moment had arrived, and with it suddenly appeared Mago and his men. They fell fiercely on the Roman flank, and, in the twinkling of an eye, put the legions to utter rout—an ideal example of a quick and decisive counterstroke.

The cold was extreme, and the pursuit was not pushed beyond the Trebbia, but thirty thousand dead remained on the field, as if to testify to the fact that the dreaded legions of Rome were no longer invincible.

As a result of the victory the greater part of Northern Italy passed into the hands of the Carthaginian, and he was able to make good his losses, and increase his army by the enlistment of a body of Gauls. His troops had suffered much from the severity of the weather, from insufficient food, and from scorbutic disorders, owing to a want of oil. So intense was the cold that almost all the elephants, and many men and horses had died from its effect. Rest was essential to enable his men to recover from the effects of their toil and hardships, and the Carthaginian army remained throughout the winter in Cis-Alpine Gaul.

The comparatively unchanging nature of strategic operations has been a theme with many military historians, and a modern English authority finds a striking resemblance between the campaigns of Hannibal in 218 B.C. and that of Napoleon III in 1859 A.D. in Northern Italy. If, however, strategy has changed little the fundamental principles of tactics have changed less. They remain precisely what they were in the days of Hannibal. But the method of their application has undergone a revolution as new conditions have arisen to change the whole aspect of modern warfare. We no longer see two armies, after having been laboriously drawn up in battle array, almost within sight of each other, suddenly precipitated into action, to decide the fate of the day ere the sun has set. On the contrary the fight now generally resolves itself into a series of distinct engagements, each raging round a different locality, on a front that may extend over a score of miles. A day, or half a day, sufficed for Hannibal to gain each of his decisive victories, but in the latest examples of modern warfare, a week or more intervened between the beginning and end of a battle. An army badly beaten can now generally make good its retreat, and live to face its conquerors on another day, and on another field. But it was not so with the Romans, their defeats developed into perfect holocausts, and fresh armies had to be again and again levied to take the place of those destroyed. Indeed it is said that the Carthaginian invasion of Italy cost the Romans no less than 300,000 men, a number probably unequalled in any campaign in the world's history.

The Consuls after their defeat at the Trebbia had fallen back on Placentia, and later had retreated in different directions, with a view to guarding the two main avenues of approach which lead from the valley of the Po into Peninsular Italy. But Hannibal when he resumed his march in the following spring crossed the Apennines by unbeaten tracks, and, after incredible hardships, at length emerged from the mountains into the fertile valley of the Arno.

He found that the division of the Roman army under Flaminius had halted at Arezzo, a city lying on the direct route he must

take if he would march on Rome. It was slightly inferior in numbers to his own force, and, confident in his own powers, he acted with the greatest boldness. The Roman commander was a man capable and experienced, but hot-headed and ambitious. Hannibal had the gift of gauging the character of his opponents, and an unerring judgment in discovering the motives which would prompt them to action. Ostentatiously passing the Roman camp almost within sight, he placed himself between the Consul and the Imperial city, harrying and devastating the country as he marched southwards, with the object of inciting him to action, and bringing on a decisive battle before he could be joined by his colleague, who, it was thought, must hurry to his aid from Rimini. The Carthaginian route skirted the north of the Trasemene Lake, and entered a mountainous region. The locality seemed created for an ambush, and the quick eye of Hannibal at once noted the configuration of the ground, and the manner in which it could be used to the best advantage. He concealed his Numidian horsemen in some wooded hillocks, not visible from the road, near a small village, at the entrance to the defile, and these he supported by a body of Gaulish infantry. On the heights overlooking the lake he posted his light armed troops. With his main body of African and Spanish infantry, and a detachment of Gaulish cavalry, he effectually closed all issue from the pass. Should the Consul, in his eagerness to avenge himself on the despoilers of his country, hasten on without the greatest precautions, his doom was sealed. His advance would be opposed by the main body, his right flank would be confined by the lake, his left by rugged heights, bristling with light armed Carthaginians, whilst the Numidians and Gauls moving into positions on the Roman rear, would bar all hope of egress in that direction. Should the victims enter the trap escape was impossible.

Encumbered with the plunder of a fertile province the Carthaginian army wended its way through the defile. Flaminius, following hotly at its heels, had reached the vicinity of the lake at nightfall. Here he determined to encamp. Next morning before dawn he continued his march, under cover of a thick fog which clinging to the shores of the lake and the lower slopes of the hills seemed to afford him a good opportunity of surprising his enemy. Fully occupied with his pre-conceived plan, he pressed rapidly forward, utterly unmindful of these precautions which alone can justify the readiness to assume great responsibility and to incur the greatest risks. Overtaking the enemy and seeing him at last offer battle, he at once prepared to accept the challenge. But the confined nature of the ground impeded all attempts at manœuvre, and before he could deploy for attack the Carthaginians were upon him. The Romans assailed on all sides, and huddled together in one seething mass fell an easy prey to the Punic levies. Before noon the battle had ended in the total defeat of the Consul. Nor was the Roman disaster confined to the shores of the lake, for Maharbal, one of the most distinguished of the Carthaginian generals, a few days later intercepted a reinforcement of 4,000 horse whom Servilius

had sent to the assistance of his colleague, and having cut most of them to pieces made prisoners of the remainder. In his pursuit on the day following the battle he had already overtaken a body of 6,000 Romans, who, with determined courage, had forced their way through the Carthaginian lines, and had compelled them also to surrender. The rout was complete, the Roman army was in fact destroyed.

The ambush and destruction of the Roman army on the shores of the Trasimene Lake is perhaps the most perfect illustration of surprise tactics in the world's history. The success of Hannibal was well merited, it was due to no adventitious circumstances, though the accidents of time and place were skilfully used to serve the great master's purpose. The plan was well conceived and rigorously executed, attributes essential to decisive victory.

The conduct of both victor and vanquished has been the subject of much criticism, the one because he did not immediately march on Rome, the other for his inaction in quietly permitting the enemy to turn his flank at Arezzo. The motives of the former will be considered later, in the meantime let us try and discover those of Flaminius. The army which he commanded was numerically inferior to that of his opponent, for after the fight at the Trebbia the Consuls, uncertain as to Hannibal's future movements, had divided their forces into two equal parts. As it was the object of the Romans to delay the Carthaginian by all in their power, it would appear that as soon as Hannibal was located in the upper valley of the Arno, both armies should have been united to oppose his further progress. Flaminius should surely therefore have fallen back slowly on Cretona, and at once summoned Servilius to his aid from Rimini. The former city was on the direct road to Rome, on the edge of a mountainous region, covering the approaches to the Trasimene Lake. Here was a country capable of defence, and here the united armies of 60,000 Romans, if they could not have defeated a much inferior force, could have at least kept it at bay. With reinforcements hurrying to their aid they must eventually find themselves in a position to act vigorously. All that was wanted was combined action on the part of the Roman Generals. Such would appear to have been the original plan of Flaminius, for as soon as he heard of Hannibal's arrival at Fiesole he despatched messengers to Rimini to urge Servilius to join him with his whole army. But the Consuls were political opponents, and, like the generals of a later date, would not always sacrifice their personal feelings to the public weal. Servilius, therefore, instead of supporting his colleague with his full strength, contented himself by sending him 4,000 horsemen. These, as we have seen, arrived too late to take any part in the actual battle, and were defeated and slain after the rout of the main body was complete. Flaminius must have felt that under these circumstances he could not successfully oppose the victor of the Trebbia, and hesitated unsupported to accept battle on the heights of Cretona, with little

hope of victory, and no good means of retreat. With a defile in his rear, defeat would mean disaster, and Rome would be open to the victor. Moreover, Hannibal by placing himself between the Roman armies and the imperial city was acting with the greatest boldness, and incurring the greatest risks. The Consul by refusing to be drawn into an engagement was anticipating the tactics of the great Fabius, and, like him doubtless, thought that he would find later a more convenient time, and advantageous occasion by which to profit. This opportunity, he imagined had arrived, when, under cover of the thick mist on the shores of Lake Trasemenus, he attempted to surprise his opponent, but perished himself with his whole army.

The cautious Fabius, the Delayer, now succeeded the slain Flaminius in command of the Roman army, and although Hannibal did everything in his power to draw him into an action it was all to no purpose. It is said that on one occasion Fabius almost outwitted the subtle Carthaginian, but the ready resource of the latter saved the situation. Overtaken by night and hemmed-in in a defile, with no visible means of escape, Hannibal at last appeared to be at his mercy, when the skilful use of an artifice again proved successful. There happened to be in the Carthaginian camp a herd of 2,000 oxen to the horns of these blazing faggots were affixed, and they were then driven up the mountain side to give the enemy the impression, an escape was being attempted in that direction. The ruse deceived the Romans, who quitted their positions to check the supposed movement, and Hannibal was thus enabled to escape from his terrible predicament unscathed.

The next great fight in the campaign was the crowning disaster of Cannae, in which Hannibal again showed his skill as a strategist and tactician. Here vast magazines had been established by the Romans, and Hannibal, whose winter supplies were well nigh exhausted, determined to replenish them at the expense of his enemies. With this object he suddenly broke up his winter quarters at Geronium, and descending into the rich and fertile province of Apulia, threw himself on the rear of the Roman army, and captured their chief base of supply. The Roman Generals now found themselves on the horns of a dilemma, two courses alone were open to them, either they must fight, or they must retire—inaction was impossible, their large army could not long subsist on the surrounding country. In their doubt they referred to Rome, where it was decided that political considerations forbade a retreat, and necessitated the arbitrament of a battle. This it was determined should be risked as soon as reinforcements, which were then being hurried forward, should have joined the Consular armies. The hostile camps at last lay only six miles apart, pitched in the open and undulating plain, which forms the little valley of the Aufidus. Some preliminary manœuvring and skirmishing now took place, each side endeavouring to obtain a tactical advantage, till at last Varro, against the advice of his colleague, who disliked to fight

a battle on ground so favourable to the invincible Carthaginian Horse, decided to strike the blow which he hoped would rid his country of the invaders. The red ensign was accordingly hoisted in the Roman camp, and the trumpets called the legions to arms. The great Carthaginian was never more confident of success, as with calmness and resolution he surveyed, from a slight eminence, the mighty host forming in battle array on the plain at his feet. But the sense of responsibility did not outweigh that of humour, and to Gisco, a noble Carthaginian, who had remarked that the numbers of the enemy was surprising, he gravely replied that yet another thing astonished him more. Upon being asked what this could be, he answered, "It is that amongst such numbers there is not another Gisco." The little joke was appreciated by his hearers, and quickly spread along the Carthaginian lines. It strengthened their confidence in the ability of a leader, who held his enemy in such contempt, that on the field of battle he could make so light of their numbers. But Hannibal had reason for his confidence, he had not been idle; as was his wont he had reconnoitred the ground, he had probed the intention of the enemy, and had already formed his plan of battle. With that imaginative genius so characteristic of all great Captains, he had pictured to himself the whole course of the coming fight, and had determined the manner in which he could best ride the whirlwind and direct the storm of strife into the channels he had prepared for them. Since his army was vastly out-numbered, he resolved to keep his infantry on the defensive in the initial stages of the fight, and to counteract his numerical inferiority by the mobility of his cavalry, and by his skill in using the accident of terrain to the best advantage. The choice of suitable ground for occupation is one of the most important operations of defensive tactics, and a rapid appreciation of its strength and weakness, and the best method of using the one and counteracting the other, is a faculty that indicates the highest military genius. In this art Hannibal excelled. He drew up his army in a crescent formation, concave to the line of the enemy's probable advance. It was essential that his flanks should be particularly strong, as they were peculiarly liable to attack. Here he placed his veteran Spanish infantry and all his cavalry, while his less reliable troops formed an arc connecting the base of the two horns. But he must not sacrifice everything to render his flanks secure, he must be prepared for other contingencies. His troops must possess mobility, to prevent the enemy surrounding him, and to enable him to change or extend his front according to the exigencies of the fight. He must also guard against the chance of his centre being broken, or of being beaten in detail, since a considerable interval separated the two wings of his order of battle. In the superiority of his admirable cavalry, however, he possessed a force which efficiently fulfilled these requirements. His plan of action was to induce the Romans to disregard the flanks, and strike at the weak centre, his wings would then wheel inwards and totally envelop them, while the cavalry, by moving round the

rear would effectually cut off all hopes of retreat. But he was too great a soldier to trust entirely to any pre-conceived notion of the enemy's movements, and must have provided against all other contingencies.

The plan of the Roman attack showed little skill, and for success it depended on their vast superiority in numbers and the well-trying courage of their legions. The genius of Hannibal had again induced the Romans to sacrifice many of the advantages of offensive action, and had again drawn them into battle on ground of his own choosing, in conformity with his own plans. Although the Roman army out-numbered the Carthaginian by more than two to one, their line of battle did not outflank that of their enemies, so close were their formations that any but the simplest manœuvres were rendered well-nigh impossible. Their main, and practically their only, attack was delivered directly to their front at the Carthaginian centre, but a division of 10,000 men had been told off to cause a diversion by surprising and capturing the Carthaginian camp, which it was thought Hannibal could ill-spare troops to defend. The day favoured the Carthaginians, a strong wind had arisen, which stirred up the light soil, and blew clouds of dust into the faces of the Romans, as they advanced in deep and close masses to attack the weak centre. Scarcely able to breathe, and dimly conscious of their surroundings, they pressed forward into the very jaws of death, driving before them the Balearic slingers and other light troops. The transition from the defensive to an active offensive has been called one of the most delicate operations in war, and Hannibal showed how its successful issue must depend more on leadership and the time for it being happily chosen than upon the form it may actually assume. When he saw the confusion in the Roman ranks, and judged the legions were too deeply committed to attempt to withdraw, he ordered an advance all along his line, at the same time sending orders to his cavalry—who had already swept the enemy's horse from the field—to fall vigorously on their rear. A whirling cloud of dust moved swiftly across the plain, bearing with it the trampling sound of a charging multitude. Onward it swept, carrying all before it, till it finally merged itself in a still darker sky.

The thunder clouds close o'er it, which when rent,
The earth is covered thick with other clay,
Which her own clay shall cover, heaped, and pent ;
Rider and horse, friend, foe, in one red burial blent.

Enveloped on all sides, and pressed into a dense mass without the possibility of resistance, the fight like that at the Trasimene Lake, developed into a massacre—there was no question of quarter. Nor did the force, detailed to surprise the Carthaginian camp, escape the fate of their comrades, for the raw Punic levies made a gallant resistance, and the Romans were still besieging them, when Hannibal, now completely successful, hurried to their relief. The besiegers were themselves surrounded, and although they were allowed to escape

with their lives, they were forced to an unconditional surrender. The Consul Aemilius Paulus and forty thousand Romans perished on that awful day, while almost an equal number were made prisoners. Success the most complete crowned the genius of Hannibal: the victory was decisive, the Consular army was destroyed. A remnant escaped to Canusium, some seven miles distant, and gained a temporary resting-place behind its strong walls. The Consul Varro, however, with a body-guard of 300 horse, fled from the stricken field towards the capital, and did not draw rein till he reached the city of Venusia. From thence he sent messengers to the Senate informing them of his defeat, but the unconquerable spirit of the Conscript Fathers rose superior to the disaster, and with undaunted confidence they prepared to defend their city to the last. There was no reviling of the defeated Consul, there was no talk of surrender: there was not even a suggestion of terms of peace, all hasty dissensions were forgot, and a united nation still bade defiance to the victorious Carthaginian.

And now let us return to the fight, and follow in a little detail the exploits of the Carthaginian cavalry on that memorable day. Their Commander, Hasdrubal, had under his orders a body of 10,000 horsemen, and well did he anticipate the Napoleonic axiom that cavalry charges are equally useful at the beginning, the middle, and the end of the battle. His first objective had been the regular line of the Romans, and these, ere the battle had well-nigh begun, he had charged face to face and, after an obstinate resistance, had driven from the field. He then rallied his men and led them to support the Numidians on the right wing against whom the Roman axes had hitherto maintained their ground. On his approach, however, they fled, and leaving the Numidians to pursue, he brought up his own force to the centre of the field in rear of the Roman infantry. These, as we have seen, were then engaged in front and flanks by Hannibal's African and Spanish veterans and Hasdrubal, by a well-timed charge on their rear, effectually decided the fortunes of the day.

The Carthaginian horse were fortunate in their leaders, who possessed to a marvellous degree the cavalry spirit of enterprise and dash. They were never idle: they were quick to decide, to dash, and quick to ret. There may be infantry fights and artillery duels in which all depends on the man on the ranks or on him behind the guns, but in cavalry contests leadership is everything: the rest is of small account. The achievements of the Numidians must remain examples for all time: they have never been equalled. Never has cavalry played so prominent a part in any campaign, never has it achieved greater results or inflicted so many material losses on its foes. For thirty years these daring horsemen were employed in a hostile country with none but their own axes, or magazines of stores, and as often as not far removed from any means of support. Their independence was remarkable, and this added to that mobility, which has ever been one of the chief factors of success in

war, enabled them to effect many surprises, and opened up to them many opportunities of distinction. Their marked efficiency in the service of security is also to be noted; this must have relieved the mind of their great chief of those apprehensions, which in lesser characters so often paralyse action, and adversely affect the moral of an army. And to an army so constituted moral was the very breath of its nostrils.

But even in those days cavalry was an auxiliary arm, and that it must remain so cannot be denied. The fate of the vast bodies of mounted men who appeared to decide the destiny of nations during the centuries that followed the downfall of Rome, and preceded the consolidation of the modern European nations, serves but to confirm this maxim. Let it, however, be granted that cavalry by its modern equipment has regained in some degree a certain independence of action, and acquired a strategic roll it did not formerly possess. Though in civilized warfare it has lost the power of inflicting the appalling losses of the Carthaginians, its effect in the field of battle could never have been judged by the victims of its sabres alone. A truer and more scientific standard must be applied when its moral effect, and the results of its skilful tactical handling are considered. How often has the value of those proved incalculable, and out of all proportion to the actual losses of the enemy.

Hannibal has been blamed by critics of all ages for not following up his crowning victory at Cannae, by marching on Rome. Livy says it was firmly believed that one day's delay saved the State, and Maharbal, the master of the horse, and one of the best cavalry leaders the world has ever seen, would appear to be of the same opinion. In vain did he urge an immediate pursuit, but all to no purpose. "Let me advance instantly with the horse," he is reported to have said, "and do thou follow to support me. In four days' time thou shalt sup with me in the Capital." But the great Captain remained obdurate, and his irate Lieutenant, no longer able to control his feelings, thus continued:—"Verily the gods have not bestowed all things on one man, thou knowest how to conquer, Hannibal, but thou dost not know how to use thy victory."

The first great principle of offensive strategy must always be to seek out the armed forces of the enemy, to bring them to battle, and to defeat them decisively. The second principle is less fallible, but it almost invariably is to march on the enemy's capital, and by its capture, paralyze the organization of his government; or to occupy a province whose loss would compel him to make peace. Alexander marched on Babylon after his great victory at Arbela. Napoleon had as his objective points on various campaigns, Berlin Vienna, Madrid and Moscow; the allies in 1814-15 Paris; the Prussians in 1866 Vienna; the Germans in 1870-1 Paris; the Russians in 1827 and 1878 Constantinople; and we ourselves in numerous small wars have regarded the capital of the country as the objective of our operation. But the attainment of this objective point is a secondary consideration to that of the defeat of the

The cold was extreme, and the pursuit was not pushed beyond Trebbia, but thirty thousand dead remained on the field as if to testify to the fact that the dreaded legions of Rome were no longer invincible.

As a result of the victory, the greater part of Northern Italy passed into the hands of the Carthaginian, and he was able to make good his losses, and increase his army by the enlistment of a body of Gauls. His troops had suffered much from the severity of the weather, from insufficient food, and from scorbutic disorders, owing to a want of oil. So intense was the cold that almost all the elephants, and many men and horses had died from its effects. Rest was essential to enable his men to recover from the effects of their toil and hardships, and the Carthaginian army remained throughout the winter in Cis Alpine Gaul.

The comparatively unchanging nature of strategic operations has been a theme with many military historians, and a modern English authority finds a striking resemblance between the campaigns of Hannibal in 218 B.C. and that of Napoleon III in 1859 A.D. in Northern Italy. If, however, strategy has changed little, the fundamental principles of tactics have changed less. They remain precisely what they were in the days of Hannibal. But the method of their application has undergone a revolution, as new conditions have arisen to change the whole aspect of modern warfare. We no longer see two armies after having been laboriously drawn up in battle array, almost in the sight of each other, suddenly precipitated into action, to decide the fate of the day ere the sun has set. On the contrary, the fight now generally resolves itself into a series of distinct engagements, circling round a different locality, on a front that may extend for a score of miles. A day or two a day, sufficient for Hannibal to give each of his decisive victories, but in the latest examples of modern warfare a week or more intervened between the beginning and end of a battle. An army badly beaten can now get away untraced to its retreat, and has to face its conquerors on another day, at yet another field. But it was not so with the Romans; their tactics developed into perfect hit-and-runs, and fresh armies had to be raised and again bled to take the place of those destroyed. It is, indeed, said that the Carthaginian invasion of Italy cost the Romans no less than 700,000 men, a number probably unexceeded in any campaign in the world's history.

The Gauls, after their defeat at the Trebia, had to retreat on Placentia, and then had retired in different directions with a view to guarding the two main avenues of approach which led from the valley of the Po to the Poenine Pass. But Hannibal, when he resumed his march in the following spring, crossed the Apennines by a hidden track, and then descended the valley of the Arno, which emerged from the mountains at the foot of the Fieschi

He found that the cities of the Roman army in the Fieschi mountains had retired at Arretium, a city lying on the frontier of the great

take if he would march on Rome. It was slightly inferior in numbers to his own force, and, confident in his own powers, he acted with the greatest boldness. The Roman commander was a man capable and experienced, but hot-headed and ambitious. Hannibal had the gift of gauging the character of his opponents, and an unerring judgment in discovering the motives which would prompt them to action. Ostentatiously passing the Roman camp almost within sight, he placed himself between the Consul and the Imperial city, harrying and devastating the country as he marched southwards, with the object of inciting him to action, and bringing on a decisive battle before he could be joined by his colleague, who, it was thought, must hurry to his aid from Rimini. The Carthaginian route skirted the north of the Trasimene Lake, and entered a mountainous region. The locality seemed created for an ambush, and the quick eye of Hannibal at once noted the configuration of the ground, and the manner in which it could be used to the best advantage. He concealed his Numidian horsemen in some wooded hillocks, not visible from the road, near a small village, at the entrance to the defile, and these he supported by a body of Gaulish infantry. On the heights overlooking the lake he posted his light armed troops. With his main body of African and Spanish infantry, and a detachment of Gaulish cavalry, he effectually closed all issue from the pass. Should the Consul, in his eagerness to avenge himself on the despoilers of his country, hasten on without the greatest precautions, his doom was sealed. His advance would be opposed by the main body, his right flank would be confined by the lake, his left by rugged heights, bristling with light armed Carthaginians, whilst the Numidians and Gauls moving into positions on the Roman rear, would bar all hope of egress in that direction. Should the victims enter the trap escape was impossible.

Encumbered with the plunder of a fertile province the Carthaginian army wended its way through the defile. Flaminius, following hotly at its heels, had reached the vicinity of the lake at nightfall. Here he determined to encamp. Next morning before dawn he continued his march, under cover of a thick fog which clinging to the shores of the lake and the lower slopes of the hills seemed to afford him a good opportunity of surprising his enemy. Fully occupied with his pre-conceived plan, he pressed rapidly forward, utterly unmindful of these precautions which alone can justify the readiness to assume great responsibility and to incur the greatest risks. Overtaking the enemy and seeing him at last offer battle, he at once prepared to accept the challenge. But the confined nature of the ground impeded all attempts at manœuvre, and before he could deploy for attack the Carthaginians were upon him. The Romans assailed on all sides, and huddled together in one seething mass fell an easy prey to the Punic levies. Before noon the battle had ended in the total defeat of the Consul. Nor was the Roman disaster confined to the shores of the lake, for Maharbal, one of the most distinguished of the Carthaginian generals, a few days later intercepted a reinforcement of 4,000 horse whom Servilius

had sent to the assistance of his colleague, and having cut most of them to pieces made prisoners of the remainder. In his pursuit on the day following the battle he had already overtaken a body of 6,000 Romans, who, with determined courage, had forced their way through the Carthaginian lines, and had compelled them also to surrender. The rout was complete, the Roman army was in fact destroyed.

The ambush and destruction of the Roman army on the shores of the Trasemene Lake is perhaps the most perfect illustration of surprise tactics in the world's history. The success of Hannibal was well merited, it was due to no adventitious circumstances though the accidents of time and place were skilfully used to serve the great master's purpose. The plan was well conceived and rigorously executed, attributes essential to decisive victory.

The conduct of both victor and vanquished has been the subject of much criticism, the one because he did not immediately march on Rome, the other for his inaction in quietly permitting the enemy to turn his flank at Arezzo. The motives of the former will be considered later, in the meantime let us try and discover those of Flamminius. The army which he commanded was numerically inferior to that of his opponent, for after the fight at the Trebbia the Consuls, uncertain as to Hannibal's future movements, had divided their forces into two equal parts. As it was the object of the Romans to delay the Carthaginian by all in their power, it would appear that as soon as Hannibal was located in the upper valley of the Arno, both armies should have been united to oppose his further progress. Flamminius should surely therefore have fallen back slowly on Cretona, and at once summoned Servilius to his aid from Rimini. The former city was on the direct road to Rome, on the edge of a mountainous region, covering the approaches to the Trasemene Lake. Here was a country capable of defence, and here the united armies of 60,000 Romans, if they could not have defeated a much inferior force, could have at least kept it at bay. With reinforcements hurrying to their aid they must eventually find themselves in a position to act vigorously. All that was wanted was combined action on the part of the Roman Generals. Such would appear to have been the original plan of Flamminius, for as soon as he heard of Hannibal's arrival at Fiesole he despatched messengers to Rimini to urge Servilius to join him with his whole army. But the Consuls were political opponents, and, like the generals of a later date, would not always sacrifice their personal feelings to the public weal. Servilius, therefore, instead of supporting his colleague with his full strength, contented himself by sending him 4,000 horsemen. These, as we have seen, arrived too late to take any part in the actual battle, and were defeated and slain after the rout of the main body was complete. Flamminius must have felt that under these circumstances he could not successfully oppose the victor of the Trebbia, and hesitated unsupported to accept battle on the heights of Cretona, with little

hope of victory, and no good means of retreat. With a defile in his rear, defeat would mean disaster, and Rome would be open to the victor. Moreover, Hannibal by placing himself between the Roman armies and the imperial city was acting with the greatest boldness, and incurring the greatest risks. The Consul by refusing to be drawn into an engagement was anticipating the tactics of the great Fabius, and, like him doubtless, thought that he would find later a more convenient time, and advantageous occasion by which to profit. This opportunity, he imagined had arrived, when, under cover of the thick mist on the shores of Lake Trasemenus, he attempted to surprise his opponent, but perished himself with his whole army.

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And now let us return to the fight, and follow in a little detail the exploits of the Carthaginian cavalry on that memorable day. Their Commander, Hasdrubal, had under his orders a body of 10,000 horsemen, and well did he anticipate the Napoleonic maxim that cavalry charges are equally useful at the beginning, the middle, and the end of the battle. His first objective had been the regular horse of the Romans, and these, ere the battle had well-nigh begun, he had charged face to face, and, after an obstinate resistance, had driven from the field. He then rallied his men, and led them to support the Numidians on the right wing, against whom the Roman allies had hitherto maintained their ground. On his approach, however, they fled, and leaving the Numidians to pursue, he brought up his own force to the centre of the field in rear of the Roman infantry. These, as we have seen, were then engaged in front and flanks by Hannibal's African and Spanish veterans and Hasdrubal by a well-timed charge on their rear, effectually decided the fortunes of the day.

The Carthaginian horse were fortunate in their leaders, who possessed to a marvellous degree the cavalry spirit of enterprise and dash. They were never idle, they were quick to see, quick to decide, and quick to act. There may be infantry fights, and artillery duels in which all depends on the man on the ranks, or on him behind the guns, but in cavalry combats leadership is everything, the rest is of small account. The achievements of the Numidians must remain examples for all time, they have never been excelled. Never has cavalry played so prominent a part in any campaign, never has it achieved greater results, or inflicted such material losses on its foes. For fifteen years these irregular horsemen were employed in a hostile country with none but temporary bases or magazines of supply, and as often as not far removed from any means of support. Their independence was remarkable, and this, added to that mobility, which has ever been deemed one of the chief factors of success in

war, enabled them to effect many surprises, and opened up to them many opportunities of distinction. Their marked efficiency in the service of security is also to be noted; this must have relieved the mind of their great chief of those apprehensions, which in lesser characters so often paralyse action, and adversely affect the moral of an army. And to an army so constituted moral was the very breath of its nostrils.

But even in those days cavalry was an auxiliary arm, and that it must remain so cannot be denied. The fate of the vast bodies of mounted men who appeared to decide the destiny of nations during the centuries that followed the downfall of Rome, and preceded the consolidation of the modern European nations, serves but to confirm this maxim. Let it, however, be granted that cavalry by its modern equipment has regained in some degree a certain independence of action, and acquired a strategic roll it did not formerly possess. Though in civilized warfare it has lost the power of inflicting the appalling losses of the Carthaginians, its effect in the field of battle could never have been judged by the victims of its sabres alone. A truer and more scientific standard must be applied when its moral effect, and the results of its skilful tactical handling are considered. How often has the value of those proved incalculable, and out of all proportion to the actual losses of the enemy.

Hannibal has been blamed by critics of all ages for not following up his crowning victory at Cannae, by marching on Rome. Livy says it was firmly believed that one day's delay saved the State, and Maharbal, the master of the horse, and one of the best cavalry leaders the world has ever seen, would appear to be of the same opinion. In vain did he urge an immediate pursuit, but all to no purpose. "Let me advance instantly with the horse," he is reported to have said, "and do thou follow to support me. In four days' time thou shalt sup with me in the Capital." But the great Captain remained obdurate, and his irate Lieutenant, no longer able to control his feelings, thus continued:—"Verily the gods have not bestowed all things on one man, thou knowest how to conquer, Hannibal, but thou dost not know how to use thy victory."

The first great principle of offensive strategy must always be to seek out the armed forces of the enemy, to bring them to battle, and to defeat them decisively. The second principle is less fallible, but it almost invariably is to march on the enemy's capital, and by its capture, paralyze the organization of his government; or to occupy a province whose loss would compel him to make peace. Alexander marched on Babylon after his great victory at Arbela. Napoleon had as his objective points on various campaigns, Berlin Vienna, Madrid and Moscow; the allies in 1814-15 Paris; the Prussians in 1866 Vienna; the Germans in 1870-1 Paris; the Russians in 1827 and 1878 Constantinople; and we ourselves in numerous small wars have regarded the capital of the country as the objective of our operation. But the attainment of this objective point is a secondary consideration to that of the defeat of the

enemy's army. This must always be the first aim, and can only be obtained by means of a battle, the decisive act of war which commands and determines all other operations. The possession of the capital has thus always been held to be of the greatest importance, but the examples of Russia in 1812, of Spain in the Peninsular war, and of ourselves in the Boer campaign, show that the greatest strategists may at times over-rate its value, if the enemy has not been previously crushed. In a centralized administration, like that of Rome, however, the fall of the City must have meant the destruction of the State, and the breaking up of the Latin confederacy. Why then, have asked the critics of all ages, did not Hannibal, after his crowning victory at Cannae, march on Rome?

The simplest answer that suggests itself to that question, is, that the chance of success was not commensurate with the risk of failure. At this time Hannibal was about 32 years of age, his physical vigour was intense, his mental faculties unimpaired, and his health, that condition so essential to a General, apparently robust. If a man of such consummate ability, of such transcendent genius, in the full possession of all his physical and mental qualities, and on the actual theatre of operations, did not apparently act in accordance with what soldiers of all times have deemed to be one of the first principles of warfare, it follows, I think, that our knowledge of the attendant circumstances is too limited to admit of any criticism.

It is indeed less profitable to criticise than to seek the motives of a master of the art of war, so let us try to conjecture some of the weighty reasons that may have prevented Hannibal from reaping the full fruits of his successes. It was his aim to appeal to the Latin peoples as a national deliverer, rather than as a foreign invader, and thus to detach the Roman allies, and break up the confederation on which the might of Rome depended. But up to this time not one of the nations of Italy had declared for him. His resources were limited; his successes had chiefly been due to his cavalry, and this was hardly the arm with which to conduct a protracted siege. Rome was 200 miles away, and could not be taken by a *coup-de-main*; there was still ample time for the stern Roman character to recover from a temporary panic. Had he attempted the capital and failed, he would be the less likely to gain over any to his cause, and he still had hopes that time would tell in his favour. Philip of Macedon had given him a half-hearted support, he might yet more materially come to his aid; there were other enemies of Rome outside the Italian Peninsula. His own countrymen might act more generously towards him, when they heard of his great victory, and at last extend to him that material support of which he stood so much in need. Indeed it did appear that at last they had resolved to prosecute the Italian campaign more rigorously, for after the news of Cannae had reached Carthage, Hasdrubal was ordered to march to the support of his brother. A reinforcement of 12,000 foot and 1,500 horse was at the same time levied for his assistance, but this was deflected to Spain on receipt of the news of a decisive battle

on the Ebro, in which the Carthaginians were totally defeated. It is hardly possible to exaggerate the importance of this almost unknown fight, for it delayed the advent of Hasdrubal into Italy for eight years. Had a fresh Carthaginian army joined Hannibal for the campaign of 214-15, the danger to the Roman State must have been infinitely increased.

Be this as it may, Hannibal profited little by his victory; he still hesitated to advance on Rome, and confined his success to taking possession of Capua, the most rich and powerful city in Italy after the capital. The Romans would not now meet him in battle, but returned to the defensive tactics of the Dictator Fabius. By keeping within fortified lines, and close to the slopes of the mountains, they rendered his cavalry almost ineffective, and a glance at a map will show how the physical configuration of Italy aided these methods. Hannibal had neither the men nor the material to conduct a series of sieges; some of the Italian peoples had now certainly joined him, and he had received a reinforcement of about 4,000 Numidians from Carthage, but three years of incessant war had taken a heavy toll from his African and Spanish veterans. As these melted away their places had to be filled by raw levies; indeed, it is said, that even as early as the battle of Cannae half his army was composed of Gauls. He could not therefore assume the offensive with much effect, but he more than held his own against the Roman armies. We have only to mention his advance up to the very walls of the City, his victories over the armies of Fulvius, Gracchus, and the Prætor Gneius Fulvius, the brilliant cavalry actions near Venusia, where finally the two Consuls, Crispinus and Marcellus were ambushed and slain, and the raising of the siege of Locri, to show that the ease and luxury of Capua had not daunted the valour of his troops, nor unnerved his energetic spirit.

At the close of the year 208 the condition of the Roman State was most critical. She had made superhuman efforts to expel the invaders from her borders, but all to no purpose, and now the rumour spread that Hasdrubal had crossed the Alps, and was actually in Italy, driving the Consul Livius southwards before him. As the distance separating the two Carthaginian armies, lessened the security of the Roman capital became the more imperilled, till it looked as if only the intervention of the immortal gods could save the State. But, chance is an element to be reckoned with in war, and how often has it happened that the best-laid schemes have been miscarried, through the want of a little luck! Hasdrubal had sent on messengers to his brother, detailing his plans, by which he proposed that the two armies should unite at Narnia, on the Flaminian Way, and march on Rome, only some 60 miles distant. But the two Numidian horsemen and four Gauls, bearing his despatches, after having traversed the greater part of Italy in safety, fell into the hands of Nero, who then commanded the Roman army in the south in observation of Hannibal. This was one of these fleeting occasions, which in war take birth and flight at the same instant, and well did Nero know how to take

advantage of it. With quickness of perception he saw that at any cost the Carthaginian armies must be prevented from uniting, and with remarkable promptness of decision he decided to march northwards to the support of his colleague with a small picked force, and bring Hasdrubal to action, ere yet Hannibal was aware of his absence. His plan was a bold one, he ran great risks of his absence being discovered, and of being defeated in detail, but it is when circumstances are the most desperate that the boldest counsels are the safest. With 6,000 infantry and 1,000 cavalry he at once set out on his unparalleled march—a march which is justly celebrated as one of the finest strategic movements on record, and which in the magnitude of its results has well been called unequalled—for it decided the fate of Hannibal, and the final triumph of Rome. If we search history for an exploit comparable to this, perhaps it is only to be found in Marlborough's great march from Flanders to the Danube, when, leaving his sea and land base, he placed himself between the French and their objective—Vienna. The decisive battle of Blenheim was the consequence of the strategy of Marlborough, and an even greater victory crowned that of Nero.

The Carthaginian levies fought bravely at the Metaurus, but the god of battles was not on their side. Misfortune dogged the footsteps of Hasdrubal; deceived, but not dismayed, he turned fiercely to bay, and long withstood the Roman onset. The contest was unequal, but for a time victory hovered between the two armies, till Nero, by another flash of that genius which had inspired his march, secured her favors for the Romans. Baffled by the rugged nature of the ground to his front and flanks, and unable to make any impression on the Carthaginian left, he transferred a strong detachment to their right, by a long detour, unobserved by Hasdrubal, who was deficient in mounted troops. The surprise was complete, the charge which followed was as successful as it was sudden. Rolled back in disorder upon each other and overwhelmed by numbers, his veteran Spanish infantry fought gallantly to the last, but it was all to no purpose. Hasdrubal did all a man could do to stem the current of victory, and when he saw all was lost, scorning to die a Roman captive, he charged into the midst of a cohort, and met the death he coveted.

The battle of the Metaurus dealt the death-blow to Carthaginian hopes and ambitions. Hannibal with almost superhuman skill did, for a few more years, retain his hold on Southern Italy. No Roman General dared face him on the field. But the Romans carried the war into Africa, threatening Carthage, and he was recalled to defend his native city. He saw the struggle was hopeless, factions ruled the State, the army was disorganised and disaffected, and, almost worst of all, there was a dearth of that formidable cavalry which had decided so many fights in his favour. So he endeavoured to treat with Scipio. But the people would not hear of peace, and with little hope he prepared to fight his last great battle.

At Zama the first great cavalry General covered himself with glory, though in the fight he lost all but honour.

WANTED A MODERN HERCULES.

BY BRIGADIER GENERAL J. L. KEIR, COMMANDING.
THE ALLAHABAD BRIGADE.

Hercules, we are given to understand, bases his reputation as a record-breaker on having cleaned out the Augean Stable. An opportunity at present exists for any one anxious to eclipse this ancient hero's grand performance by cleaning out the Indian kitchen.

Although as a nation we pride ourselves on our cleanliness and our common sense, and our title to both these estimable qualities stands, in the main, good; still, it cannot be denied, that we are guilty of several glaring inconsistencies.

For instance, a man who is scrupulously clean in his outward appearance, and who would never entertain the idea for a moment that he should do without his daily bath, or fail to put on a clean shirt or collar, will suffer to enter his mouth, and go down his throat, food that has been cooked amidst shocking surroundings and often in the most disgusting manner. The same man will probably take great trouble to see that his dog's food has been properly prepared, and display much annoyance should his stable be dirty and there be too many flies about its precincts, while in the majority of cases his own kitchen remains a veritable chamber of horrors, which he shamelessly acknowledges his want of moral courage to face. What just claims, it may be asked, can an individual of this kind put forward to possess either of the virtues of cleanliness or common sense? And yet the case is that of a considerable percentage of Englishmen now resident in India. After the experience of a number of years in this country during which I have had opportunities, both as a staff and regimental officer, of inspecting many mess kitchens, I am convinced that much sickness in the past has been due to their insanitary condition, and to the apathy which has been displayed with regard to their proper control; and also that this evil still exists to a very unnecessary extent.

I have listened to several lectures on sanitation by medical officers without hearing this subject alluded to. Possibly it may be considered too well known to require any reference, but to the ordinary lay mind it seems inexplicable that while very great precautions are taken to prevent noxious germs from entering our mouths in the form of dust, etc., we are swallowing them daily in a much more solid form from a polluted source which no organised effort has yet been made to purify.

The problem of the sanitation of the soldier's kitchen is in a fair way to be solved in a satisfactory manner. The Europeans either cook, or supervise the cooking themselves; the kitchens are

regularly inspected and are provided with proper utensils. In many kitchens there are Warren's cooking stoves, and in nearly all a specially trained cook supervises the cooking and instructs the cook. Any defect in the construction of the cook-house is at once rectified, and the native attendants are obliged to wear clean clothes and to wash themselves before handling the rations.

Enter however an officer's kitchen, whether that belonging to a mess or to a married man, and you are likely to find a complete reversal of all the above conditions. Many women in India openly admit their abhorrence of anything that concerns the kitchen, while their husbands do not consider its inspection a portion of the domestic burden which they are called on to share. Things may, or may not be, better in the officers' mess. In some British regiments the Mess Sergeant does his duty and keeps the kitchen in proper order. A few Indian infantry and battery mess kitchens are bad enough to make one wonder how the officers keep as well as they do.

The pig is, we are told, not by inclination such a dirty animal as some would have us believe. Give him a neat sty, and clean straw, and he will do it justice and repay his owner for the attention. It is the same with the native cook. Give him proper cooking utensils, the means of washing and keeping clean, a plentiful supply of fresh water, a spacious and airy kitchen, and above all encourage him by interest and daily visits to live up to your ideal and he will be found to repay the trouble spent on him. He is the one servant of all others you should be on good terms with.

If anyone cares to pursue this subject further he cannot do better than read that Indian classic "Culinary Jottings" by Wyvern. The chapter at the end on Indian kitchens is full of information imparted in a most entertaining form. Would that matters had been much mended since he penned it!

The mistake made by our ancestors when they first conquered India has never been rectified, and dearly have we paid for it! How dearly no one knows!

Had they on their arrival in the country insisted on the most minute cleanliness in the preparation of their food, things might have been different. They, however, allowed the opportunity to slip and we have been paying for their mistake ever since. The situation is unfortunately aggravated by the fact that the natives of this country consider many of our favourite foods unclean, and a large section of them carry care and cleanliness in the preparation of their food to an extreme. The result is that they have come to regard the European as a being who will eat anything, and for whom anything is good enough. We have certainly given and are still giving them much encouragement in this view.

While a hungry Hindu will throw away his dinner, over which the shadow of a white man has chanced to pass, the food of the European is in many cases prepared in a hovel which serves most of his servants as a smoking room by day, and a sleeping apartment by night.

Beyond stating this I will not enter into the numerous other unsavoury details connected with its culinary treatment before it reaches its terminus, in this case represented by the mouth of the cook's employer.

Though a large number of people acquiesce in the correctness of the above statement they are as a rule quite content to accept the situation and adopt a "non-possumus" attitude. But ought these things to be, and can we do nothing to alter them?

At present not only is our health jeopardised by our foolish inaction, but a positive danger awaits us should the cook, who has up to the present contented himself by, so to speak, poisoning us by passive methods, adopt active ones. Many inquiries after deaths from cholera in private houses disclose carelessness beyond belief in the kitchens and their surroundings, but in no case is the cook considered responsible or is any note made of his name as one unfit for further employment. We have allowed the standard to sink to the lowest level and there it will remain.

Why do we eat inferior meat, sodden vegetables, tepid soup and other nastinesses? Simply out of the purest laziness, and because we are too slack to attend to such unimportant details. The more we investigate, the more we are struck by the disproportionate-ness of the whole aspect of the case.

Many officers spend a considerable time daily in examining animals' food who cannot spare time to inspect the raw materials which they and their brother officers are about to consume. They will probably tell you that they could not eat their dinner if they did, and yet there is nothing disgusting in the grill room of a London eating house, or in a butcher's, fishmonger's or poulterer's shop.

So much for destructive criticism. Let us now seek for a practical remedy commencing by a search for the individual responsible for this lamentable state of affairs.

Acting on the proverb, that those absent are always in the wrong, we have already determined that our ancestors are blame-worthy, and that had they only done their duty we should not be face to face with our present difficulty. Although this may be a comforting reflection it brings us no nearer to the solution of the problem before us.

There is, it is to be feared, no disguising the fact that the Generals, the Commanding Officers, the P. M. O.'s, the Medical Officers, the Mess Secretaries, the officers, and lastly the officers' wives * are all in part responsible for the existing state of affairs, and it is only by a strong combination of all of them that we shall be able to free ourselves from the tyranny of the cook. The answer then is—Combine and organise.

If Generals of divisions will personally interest themselves in the subject and always include the officers' mess kitchen in the inspection of the unit, or better still inspect it when they dine or lunch

* Mentioned last for the sake of emphasis and not in the order of their importance.

at the mess. If C. O.'s will do the same once a week, and if the Mess Secretary will do so daily matters will soon mend and the P. M. O. and Medical Officer, who have been held in reserve, will not probably be required to make more than an occasional surprise visit. I would lay special stress on occasional inspections at night to see that the kitchen is well lighted. The key should be handed in at a certain hour to prevent the room being slept in. This latter precaution is very necessary in cold climates.

At present it is not customary for Generals to inspect officers' mess kitchens although the men's, which are in infinitely better order, are regularly visited by them. I am aware that there are exceptions to this but I am speaking generally.

Although many C. O.'s inspect their officers' mess kitchen, they do so either on fixed days or after due notice has been given and therefore see matters at their best.

The Medical Officer is often a dining member of the mess and very diffident about bringing to light what he knows to be wrong, or possibly after reporting things once or twice, and finding that no notice is taken, he complacently accepts the situation preferring to let matters remain as they are rather than have any unpleasantness with his hosts for the time being.

The Mess Secretary is probably a young officer in rude health and with an unfailing appetite, who considers any work in connection with the kitchen derogatory. A lifeless, mechanical performance of his duty is all that he can afford in this direction.

Reform is required under two main heads—the cook and his kitchen.

The modern Indian cook is produced from the bazaar and you are lucky if you can discover anything of a reliable nature about his previous history. He is always supplied with a large number of bits of paper which describe the virtues of a man who may or may not be himself. All means of identification are as a rule lacking and quite young men have been known to present testimonials earned about the time of the Mutiny.

Owing to the fact that some people never enter their kitchens, so-called cooks are engaged who earn reputations for skill in their craft by the simple device of calling in the aid of a brother cook of superior attainments whenever their master or mistress has friends to dine.

This is sometimes varied by one cook taking two or three situations and putting in a substitute for ordinary occasions only condescending to cook himself when there is a dinner party. The above are well authenticated facts, not loose statements.

There are plenty of good cooks, but with them we are not at present concerned. The bad cooks should however be either ended or mended, as many of them are a positive danger. The question naturally arises—How can you define a bad cook?

At present we are not in a position to determine the skill of the individual in the preparation of food but must confine ourselves to

seeing that he comes up to a certain standard of cleanliness and carries out certain sanitary laws. For this purpose I consider all cooks should be licensed under circumstances I shall explain later, and that a register of them should be kept in each cantonment in the Cantonment Magistrate's Office.

Licenses should at first be granted free subject to the restriction that they will be cancelled in case of culpable neglect certified by a Medical Officer and approved by the Cantonment Magistrate.

In case of a license being withdrawn a fresh one might be granted at the expiration of a fixed period, and on payment.

A general form of license should be issued and filled in at each station.

Licenses should be valid for one year, but should be renewable annually.

In case of cooks engaged through the Cantonment Magistrate a small fee would have to be paid to the fund to cover working expenses.

Cooks seeking employment without a license would render themselves liable to punishment. Licenses should not be transferable or valid in any other station beside the one issued in.

No unlicensed cooks should be engaged either in barracks or Cantonments.

By this means not only will the cooks be kept under some control but officers will be enabled to engage cooks about whom something is known and who can be traced. A scheme of this kind would be quite useless unless adopted by all military cantonments, but it seems to present no great difficulties such as have to be faced in the general registration of *all* servants. Should the system prove a success it might in time be extended to other servants.

If the Cantonment authorities be not legally authorised to take action as indicated above, the experiment might be tried in the Punjab and cooks included in a Licensing Act under a set of rules resembling those under which the hackney carriage driver receives his license. The matter is not one that concerns the military officers alone but extends to hotels, railway stations, clubs, etc., and other public and private civilian establishments. What should be aimed at is a general raising of the standard of kitchen management—the replacement of dirt and “Brown Sauce” by cleanliness and plain wholesome cookery.

Although the reform of the kitchen will doubtless result from the reform of the cook, there are several points in connection with the former which should be made clear, always remembering that it is most unlikely, that before things reach what are considered by the white population to amount to a serious danger, any attempt to alter them will be made. The putting of the law in motion is naturally a slow and cumbersome process and action will only result from proportionate pressure. Will any pressure be forthcoming?

Inspection to be effective must be methodical. The inspector must make up his mind as to the points to which he intends to

direct his special attention. The ordinary officer walks into a kitchen without any fixed idea in his mind as to what he intends to inspect. To assist him I will summarise under different headings what he might with advantage direct his special attention to :—

- (1) *The flooring*.—Cement is the best, but failing this the floor should be either brick or flagged stones. In any case it should be kept in good repair so that dirt cannot lodge in holes and interstices. Mud for a flooring is quite inadmissible and should not be permitted. The floor should be washed periodically and kept dry and clean.
- (2) *Ventilation*.—Good windows should be provided, and nothing should be permitted to block them. Gauze wire should be provided for both windows and doors.
- (3) *Water*.—If pipe water is not provided in the kitchen, a plentiful supply of good fresh water should be at hand and should be replenished daily. Massacks should never be permitted, all water being brought in covered iron buckets. The water arrangements in the soldiers' kitchens are excellent and consist of an outside tank of galvanised iron which is on a raised stand and can be filled from the outside. A pipe connects it into the kitchen.
- (4) *Utensils*.—This includes cooking pots, furniture, etc. Many cooks still prefer the tinned-copper dekhie to cook in, probably on account of the small monthly allowance they draw for tinning. Enamelled iron or aluminium cooking pots are preferable and are easier to keep clean and less liable to cause poisoning. The oftener all cooking pots are inspected the better.

The tables, meat-safes, chopping blocks, etc., should be kept scrubbed and free from all dirt. They require periodical renewals, as some from want of attention may become the home of most undesirable tenants.

It is no uncommon thing to find the meat-safe used as a temporary poultry house for live hens and pigeons who share the accommodation with the rest of the day's provisions.

Treat your cook liberally, even handsomely, but not extravagantly in the matter of requisites for his kitchen. If he be a good man it will repay you well. If a rogue you will soon find him out and the sooner you are rid of him the better.

- (5) *Lighting*.—If you do not light your kitchen properly at night you cannot expect good service from your cook. Therefore see that he has a good allowance of oil and gets it.
- (6) *Drainage*.—The kitchen sink for washing up should be raised well above the level of the ground so that water running out of it can be caught in a receptacle standing on or above the level of the ground outside the house.

Sunken wells to catch the drainage are an abomination and have caused much evil. They should never be allowed. A receptacle for dry refuse should also be provided outside the kitchen. Both should have covers constantly on them. It will prevent dogs from grubbing in them, and keep down the flies. The floor of the sink should be of some non-porous material so that it can be kept clean and dry.

The officer in charge of a mess will do well to bear the following in mind :—

- (1) Inspect the kitchen every day giving special attention to the above points and insisting on the cook and his assistants being cleanly dressed.
- (2) Allow no smoking or sleeping in the kitchen and only permit certain servants to enter it.
- (3) Order the dinner every day looking up the notes you have made on last night's menu and seeing that they receive attention. See what the cook has bought in the bazaar or what has been sent by your tradesmen and take his book with prices and initial it. Make the cook hand in his dirty *jharans* to the head waiter in your presence and have them replaced by clean ones. This is most necessary if cleanliness is to be kept up. Otherwise he will keep clean ones to show and keep on using dirty ones. The whole of this if carried out methodically ought not, except on special occasions, to take more than a quarter of an hour.

I shall conclude with a few remarks about the management of messes.

There is little doubt that a catering mess is much the cheaper and best. The messman is quite a superfluity and a very expensive one. He as a rule cramps the cook by starving him in provisions or by providing him with inferior ones. The best of cooks will never do any good under a grasping messman whose servant he is and not yours. Let us have no middleman. If we are to be cheated let it be done first hand, *i.e.*, by the head cook who should do the marketing and be responsible for the quality of the food supplied. If you deal with the Government dairy for milk, etc., with a good butcher and baker, and with a Government garden for vegetables, catering is not a very irksome duty, and well repays this trouble. Many excellent works have been written on this subject and with their assistance you will save money and do your mess well.

See that you have a sufficient supply of crockery for the largest number you are likely to entertain. Unless you have, either the plates will be dirty and cold or you will have agonising pauses in your dinner while they are being washed.

Fuel is expensive and you must be liberal if you expect good cooking. There is no reason however why you should keep all the mess servants in wood. Oil stoves are excellent auxiliaries to kitchen

furniture, but cooks often object to them fearing their charcoal and wood allowance will be cut.

An extravagant cook who does you well may be tolerated, but an incompetent cheat should not be endured for a moment. Cooks are like all other human beings, the more interest in and sympathy with them you show the better you will find them.

Some of the most recently built houses in Northern India have their kitchens attached to the main building and in some cases even inside them. This is an excellent plan and can only lead to the best results. The separation of the kitchen from the dwelling is one of the chief causes of the defects complained of in our Indian households. The Cantonment Committee should insist on all kitchens being kept up to a proper structural standard and the Cantonment Magistrate should make an annual report on them bringing to notice any that are below the mark. In these days of bicycles and quick transport the duties of inspection are very much simplified, and as only a certain number of kitchens would require attention the increase of work would not be great.

There is nothing new in what has been written above, but if it may have caused anyone, who has had the patience to read it, to verify practically the statements made and to assist in the "Great Cleansing" which in the opinion of many is so urgently required, the writer will feel that he has been more than repaid for his trouble.

Since writing the above I have been appointed to the command of a Brigade and have had an opportunity of putting my theory into practice. Out of the nine officers' mess kitchens in my command I found that from 40 to 50 per cent were in a very insanitary condition, two are being entirely rebuilt and two have had structural alterations made in them. Quite half of them were using massacks for the conveyance of their water, and about the same proportion had the cess-pool system of drainage without fly protected receptacles. I am still (six months after my arrival) endeavouring to perfect their outfit and management.

I append a list of questions to which answers have to be submitted to me monthly by the respective medical officers in charge, and may remark that Question 6—Are you thoroughly satisfied that the standard is up to that exacted from the British soldier in barracks?—has invariably been answered by those competent of forming an opinion, to the effect that the kitchen referred to was below the given standard. In this I entirely concur.

The one sure tell-tale at inspections of this sort is the presence of flies in any numbers. Where there is smoke there is fire, and where there are flies there is filth. No matter how clean the place may appear, you may be sure that it is only got up for inspection.

My chief hope in bringing this subject into prominence is not merely to improve the sanitary condition of officers' mess kitchens, but, in time, to raise the standard of culinary operations throughout India. With a very slight effort the standard of mess kitchens can be improved 50 per cent, and with their advance the rest of

the military community will keep pace. Once the danger of the present position is realised and fairly faced I have no fears for the future.

The difficulty is to awaken interest in what is generally regarded as a despised drudgery. I am also convinced, that the evil is so deep-seated that nothing but the personal interest of the senior officer present, supported by his superiors, can make any impression on it; and that the feeling that duties of this kind are undignified is so ingrained, that force of example to combat it is more than ever necessary. The preservation of health is too important a matter to be left to chance.

*Report on Sanitary Condition of Officers' Mess Kitchen
of _____ for the month of _____*

Questions.	Report of M. O. in charge of unit.	Remarks by P. M. O.
<p>1. <i>Condition of flooring.</i>—(Material of which composed, etc.)</p> <p>2. <i>Water Supply.</i>—(Whether pipes or wells. How conveyed to kitchen and how stored.)</p> <p>3. Whether receptacles for the removal of sullage water are of the proper pattern.</p> <p>4. General cleanliness of utensils, meat-safes, receptacles for water, etc.</p> <p>5. Is the kitchen periodically vacated and thoroughly cleaned and whitewashed.</p> <p>6. Are you thoroughly satisfied that the standard is up to that exacted from the British soldier in barracks.</p> <p>7. Give any suggestion for improvement.</p>		

AN ESSAY ON A SUGGESTED COURSE OF DOUBLE COMPANY TRAINING FOR THREE WEEKS.

BY MAJOR E. R. MORTON, 56TH RIFLES, F. F.

During the whole course of the year a Double Company Commander is only able to obtain his Double Company at war strength, when it is struck off all duties for Double Company training. **Introductory remarks.** It is therefore incumbent on them to carefully consider how this valuable opportunity may be taken advantage of in order to secure the best results. No battalion or brigade can possibly commence its annual training with any chance of success, till its integral portions, down to the smallest units, have been thoroughly grounded in their work by the officers or non-commissioned officers commanding them. I am more concerned in this essay with the results of Double Company training as effecting the battalion it belongs to. Military history of modern times bristles with so-called "regrettable instances" which can be traced to the faulty training of, possibly, the smallest unit in a battalion.

It is, I think, generally agreed that—

- (a) owing to the terrain fought over on the N.-W. Frontier wars in India; and also to
- (b) the wide distances and intervals which have to be maintained now-a-days to pass over the fire-swept ground, decentralisation of authority is the keynote to aim at in all training.

By this I do not mean to imply loss of discipline but gain. For as in the higher commands a brigade should know first what his Divisional Commander is aiming at, and then have a free hand to train his brigade in conformance with the latter's general instructions, so also the Double Company Commander should first know what his Battalion Commander's ideas are for working the whole battalion (or four Double Companies) in order that the former, though having full latitude as regards the details of his Double Company training, may train his smaller command for the benefit of the larger unit, when the four Double Companies go on to the next stage, i.e., Battalion training. In the Indian Army it is also absolutely necessary so to instruct Company Commanders and N.-C. O.'s and men that they may accept the responsibility of departing from an order, if they have to face a situation quite unforeseen when the order was given. They must be taught to exercise common sense instead of being mere machines; for who can say in the modern battlefield what occasions may arise, for the meeting of which no cast-iron rule is laid down in any book, either published by authority, or connected with former wars? So many Commanding Officers in their ambition to attain a clock-work

battalion (if I may be pardoned for using this expression) are apt so to fetter all the junior ranks that their good points are not brought out, and, above all, they lose the power which they may, or most certainly should, possess of acting without reference to superior authority when the occasion arises which may necessitate a departure from ordinary methods. I therefore urge that having given Double Company Commanders a general idea of what is required of them, they should be allowed by their Commanding Officers to select, decide, and work out their programmes themselves; for they should be the ones most acquainted with the weaknesses of their small commands, and can bring pressure to bear during their training to strengthen the weak "links" they have discovered. Double Company training, I think, must be progressive—commencing with the training of sections under their Section Commanders in the first week (as in the cavalry) and ending up in the last week with that of the whole Double Company—under the supervision of the Double Company Commander of course—all British officers being umpires.

We now come to the next point. Every officer must read up for himself, not only the history of ancient wars, but modern ones as well; our present Commander-in-Chief has placed valuable material at our disposal from the reports of experts who were present during the last great wars. From reading the above we shall arrive at conclusions which will guide us in training our men.

In India we have to be prepared to deal with problems—

- (a) which concern so-called savage warfare, i.e., those which obtain in wars on the N.-W. Frontier of India and also in bush fighting in Burma;
- (b) with civilised warfare problems, as illustrated by the Boer and Russo-Japanese wars.

I put (a) first as it may be the fortune of any of us, at any stage in our career, to be engaged in this class of warfare.

Class (b) we have to be always in a state of preparedness for. I will endeavour to show what we should teach our men in class (a) and class (b), from the experiences of the Tirah Campaign in the former, and the Transvaal (Boer) and Russo-Japanese wars in the latter. It is most difficult in open country to make the Indian imagine it is the jungle of Burma. I have therefore omitted this portion of savage warfare.

We shall benefit materially by realising what the Tirah Campaign of 1897 has to teach us on this subject; a campaign fought in a country well adapted to its hardy inhabitants, the Afridis and Orakzais, and which has to be viewed personally in order to grasp the difficulties with which troops unaccustomed to hill warfare will have to cope; against some of the best skirmishers the world can produce armed with a very fair proportion of small bore rifles, which they know are good, for many of them have probably been stolen at one time or another from us! Tribes as hardy and active as chamois impelled by the idea, not only of defending their homes

(a) **Lessons from
savage warfare.**

but with fanaticism which promises untold glories if they kill their opponents. From reading about this kind of warfare or from personal experience I would advocate the importance which must be attached to the following points:—

1. *Outposts*.—For some unknown reasons the N.-W. Frontier tribesman objects to any body of men, however small, above him. Security at the halt is therefore obtained by piqueting hills even $1\frac{1}{2}$ miles away from the camp or bivouac—(*vide* camp of the 1st Brigade at Karamna on 25th—28th December 1897). These piquets are safe. It is to be noted that piquets close round the camp should also be placed in some cases.

2. *Advanced and Rear Guards*.—The security of the advance is also attained by piqueting the hills within range, with a support to every three or four piquets. The proper method of doing so, and how connection is maintained with the column, can only be learnt by practice, and this requires a *great deal of practice*; and men have to be told that the brunt of the fighting will fall on the rear guards, the piquets joining in and strengthening them as they pass. Instances are rife of disaster which has followed the action of a piquet leaving its post by mistake. The good commanders of rear guards, with well trained regiments and smaller units under them are valuable assets. It must be impressed on the men too that no force, however small, can make even a short halt without piquets above them.

3. *Flank Guards*.—Piquets dispense with the ordinary civilised warfare flank guards.

4. *The laying out of and selection of grounds for camps and bivouacs with a defensive perimeter*—night rests for rifles—chipas.—That the reckless waste of ammunition in useless night firing is to be forbidden.

5. *Loading up of Transport*, its care, method of marching—foraging parties—convoys.—The comfort and well being of a Double Company depends on how its transport is loaded and treated.

6. How necessary it is for every officer and man to have an eye for country; if they have not that faculty then to use every endeavour to gain it.

7. *Attack*—mutual support—selection of ground to advance over and how to do it.—Once the savage enemy has got on the run to make a decisive action of it and not stop till he is either destroyed or loses his moral. The care of the wounded and conveying them along is a most trying part of this warfare: judging distances, fire control, distribution of reserve ammunition.

8. *That men thoroughly trained as scouts in the hills can get information and inflict damage, with infinitesimal loss to themselves*—(*vide* 5th Gurkha Rifle's scouts' work in Tirah, 1897).

9. *Ruses and Ambuscades* are very effective.

10. *Sungers* and their uses and abuses.

11. *Defensives*.—That a passive defence is hopeless—a vigorous defence with counter-attacks on every possible occasion will impress the enemy most.

12. Officers and men must be accustomed to hard marching and understand that they must accept responsibility and be prepared at any time to act on their own initiative.

In (a) I have noted a few of the most important lessons our men have to be taught for savage warfare of the type which obtains on the N.-W. Frontier of India ; and can now as briefly as possible deal with what is to be learnt from two recent campaigns, commencing with the Boer war. If we compare the characteristics of the combatants and their modes of fighting at the commencement of this campaign, we note that the British failed in initiative, and in the sensible application of the lessons they had learnt at Aldershot and elsewhere. They possessed discipline and courage. The Boers on the other hand had no cohesion, fought each man for himself, had common sense and initiative, but lacked discipline and any idea of mutual support in action. We want to combine the best qualifications of the combatants in this war in order to make our men what they should be. It is again prominently demonstrated that the soldier must be grounded in the principles of his work and then be encouraged to develop his powers of common sense, and initiative in such a manner as to be able to deal with the various unforeseen situations in which he may find himself, to the best of advantage, not only as regards himself, but for his comrades, holding in view the aim of his commander which has been previously explained to him.

These habits of common sense and initiative are doubtless acquired by the men who have been at any time under the fire of modern rifles, and who have fought against the Afridis and like tribes, in their rugged country, in its way an excellent training for soldiers, but one must not fall into the error of thinking the results obtained from wars with tribes wanting in leadership, discipline, cohesion, and training, will enable our men to face a war against a highly-trained, well-disciplined, and civilised enemy ; though the habits acquired in the former will doubtless enable the men concerned to adapt to themselves more readily to the new conditions they have to encounter, provided that they have previously studied or been taught what is expected generally of them. It appears to me that if one compares the Boer war with the Japanese war one cannot help being struck with the fact that in the latter, from the smallest units to the largest, the results obtained by the Japanese were due to careful training in peace time. The perfect working of the whole unit showed the perfect training of its component parts. The Boer war abounds in illustrations in its initial stages of what faulty peace training results in, *i.e.*, failure. One must however exempt the troops sent out from India, who had the previous advantages we have, of executing their peace work over large and varied tracts of country. It is most useful to the military reader, who is anxious to give his men sound teaching, to compare the attempts at crossing the Tugela, or the unsuccessful attempt on the Modder River with the successful fight at Dietfontein, and argue out for himself what was the secret of

success in the latter instances, and the causes for failure in the former. This war, I think, furnishes the following seed thoughts which may prove useful in preparing our Double Company programme for training.

1. *The necessity for information, and reliable information* of the enemy being obtained is prominently to the fore even for the smallest unit concerned.

2. The practice in peace time of methods for transmitting the information obtained to the commanders and other units in the neighbourhood.

3. *All ranks must acquire an eye for country and ground*—(vide Spion Kop where we failed to grasp, till too late, that we had taken up a useless position to entrench for defence).

4. *Touch once obtained must be kept with the enemy.*

5. (a) *That in the attack* by even a small unit, it is not sufficient only to manœuvre the enemy out of his position. The "holding" part of the attack is intended to develop such a fire as to prevent the enemy from leaving that portion of the position attacked.

(b) *The proper methods* of advancing over different kinds of grounds, and the almost mechanical reinforcing of the first line has to be taught so as to increase the volume of fire to the highest possible development before the crisis.

(c) *Always even in a Double Company to have a small unit in hand to face the unexpected.*

6. *Casualties must be practised*, juniors to at once assume command when seniors are disabled. I have found Native Officers and other ranks "killed" in peace time with difficulty realize that they are supposed to be on the instant out of action, and are very fond of shouting to the next senior to take command. I suggest that B. O.'s, N. O.'s, N.-C. O.'s and men made casualties should kneel and take off their haversacks, this being the sign that the man concerned is out of action.

7. *We must instil* into our men that it is cheaper in the end to carry a place with considerable casualties than to let an enemy escape and have to keep on fighting him.

8. *Observation of fire effect.*—I suggest each half section should have one man told off, as a trained observer, to watch where bullets strike, when this is possible.

9. *Judging distance* must go hand in hand with musketry and all out-door parades. The Boers showed us on more than one occasion how useful their knowledge of picking up ranges proved.

10. *Trenches.*—It is hardly necessary to dilate on this point—the Boer trenches are so well known—the chief points about them are that they follow the lie of the ground, and are invisible. Men should be taught that these trenches are not to be made with a view to passive defence only.

The value of dummy trenches has also been proved. Men should also learn that movement of any kind at once discloses their whereabouts. If trenches are advanced down the enemy's side of the hill, covered ways must be made to the rear.

11. *That however safe a country, either being operated over or in which a body of men is halted, appears, it is criminal to forego careful protective measures* (Sannas post is a lesson showing what neglect or careless work leads to; and even a precipitous cliff must not be left unwatched).

12. *The necessity and careful practice in peace of night operations, formations and movements, for without practice in moving over a country in the dark in peace time failure will result in action.*

13. Again the whole war shows the necessity for training all ranks to accept responsibility and act with common sense and judgment.

The excellent points worthy of note, and to be embodied even in the training of the smallest of our units, are
 (c) **Russo-Japanese War.** so numerous, that a few of the most important only can be touched on in an essay of this length. It is strikingly evidenced too by this war that the Japanese had taken to heart and practised their troops with method and common sense in the lessons they had deduced from our war with the Boers.

Prince Kraft in his "Letters on Infantry" dwells on the importance of making men hard, agile, and immured to fatigue, before they pass on to the ordinary parade exercises. The Japanese appear to do this with their men as a training for war exercises. I think we hardly grasp the necessity for doing so enough. For instance I understand the Japanese make short rushes during the attack advance; and the value of passing over 50 to 70 yards at a time of the fire-swept zone at top speed appears self-evident; there is just as much necessity to practice one's muscles to do this as it is for a man to train for a short race. He has to rise, rush, and lie down at once at the spot he has selected to advance up to.

2. *Attack.*—(a) The Japanese deploy from close to extended order *very rapidly*, then advance by waves: the supports in the same formation at about 150 yards distance.

(b) *Digging during the attack.*—As soon as we can get sufficient tools and suitable ones, this should be second nature to the skirmisher. The Japanese firing line half completed a shelter trench and then advanced at the double, and occupied a fresh one, while the supports completed the first one. From the little practice I have been able to give my Double Company, I believe our men will be quite as keen and good as the Japanese are.

(c) To at once prepare a position taken for defence and be ready to repulse a counter-attack.

3. *Reconnaissance.*—Our men in the Indian Army require a lot of practice in sending in good reports and should be taught what points to leave alone and what to report on. The Japanese also thoroughly reconnoitred the ground they purposed operating over. Reports should never be sent in by less than two orderlies.

4. *Secrecy.*—Not an inkling of what was about to occur could be obtained even from the private soldier.

5. *Outpost Duties*.—Dispositions appear to have been the same as ours, the Japanese troops only show us how carefully, strictly and with what common sense they carried out their duties, the excellent results in war being due to good peace training.

6. *Scouting—Spies*.—The value of reliable scouting, the methods of passing information, seems to have been perfected by the Japanese. At the same time we are far ahead of them as regards signalling by helio, flag, and lamp. From what I can gather too, though it is opposed to all our old ideas, our men must be practised to spy in peace time, and be made to be on the look out for spies in their midst. There can be no reason why this should not be done in manœuvres or training if it is required in war. If it leads to nothing else it will ensure the practice of secrecy. The Russians could find out next to nothing about the Japanese, whereas the Boers knew all they wanted to about us.

7. Even the smaller unit commanders must learn that it is their object to push whatever they are going to do through in the way most advantageous to themselves, and not to do it in the way the enemy wishes them to, also not to disclose to the enemy by their own movements what he is reconnoitring to learn—(*vide* the passage of the Yalu, the Japanese precautions, as compared with the Russian's want of them).

8. *Trenches*.—The importance of concealing their trench positions in every way was thoroughly grasped by the Japanese; and the disastrous results of want of head-cover and exposure to view of the Russian trenches is instructive.

9. *Distribution of ammunition and replenishing*.—The results of peace practice in war training are here worthy of note.

10. *Infantry* (even the Double Company) should be practised with artillery and cavalry in order that the necessary co-operation and mutual support requisite can be realised in peace trainings. I suggest one or two days in the training being devoted to this. The methods of passing over ground too, which has been successfully ranged by the enemy's artillery, may be gathered from several of the Japanese successes.

11. *Night Operations*.—The Japanese usually assaulted just before dawn. It is hardly necessary for me to so enlarge on the careful peace preparations necessary to ensure the success of night operations in war. Our failures in the Boer war when compared with the Japanese successes are evidence of the results ensuing from the previous peace trainings of the troops concerned.

12. *The necessity for decentralisation of authority*, which can only be attained by making all ranks do their own work, and *not do it* for them, as well as to accustom men to responsibility, and to assume higher commands than their own at a moment's notice, can only be practised in peace, to be of use in war.

13. *Obstacles*.—The making of modern obstacles, wire entanglement, mines, etc., should receive more attention in peace manœuvres. This can only be done if a sufficient supply of material

can be obtained. A certain number of men per company should always have wire-cutters, and be taught how and when to use them.

14. *The number of good glasses* supplied by Government to the rank and file in the Japanese Army was far in excess of what we have. Observation can be cultivated without glasses, but the human sight is limited, and I think our supply is meagre in comparison to the good results obtainable if a larger supply were issued. In any case every N.-C. O. should have a good pair and be taught how to use them.

15. It must be patent to all that the net results of the war I am noting on show how carefully the principles of war were inculcated into each man's brain; and how the men had latitude given them and were able to apply these to the varied situations which they encountered without flinching against a European foe. One cannot help being struck in considering the three wars I have touched on, that to prepare a man for war, civilised or otherwise, the same qualities require to be developed.

Considering that for the greater portion of the year, owing to duties, furlough, leave, etc., neither Double
Conclusion. Company Commanders, Company nor Section Commanders, ever have an opportunity of seeing their units at full strength, and also that sections are frequently worked by senior sepoy or junior N.-C. O.'s, I think it is remarkable how well trained they are. It rests therefore with the Double Company Commander at Double Company training to rouse a spirit of enthusiasm by making his work as interesting and realistic as possible, and thus prevent men from thinking it is a thing that has to be got through and the sooner it is done the better. I think tents should always be carried and used; and officers and men be made as comfortable as possible.

2. I do not personally believe much in lectures to Native troops. Each day's work should be prefaced by a short but careful explanation of the work about to be undertaken on the ground about to be worked over; and at the end of the problem set, the faults which have actually come to notice should be impressed on all concerned then and there.

3. Field practices with ball should go hand in hand with the advanced stages of Double Company training; and the results of careful training on measured ranges can then be put to practical use under service conditions.

4. A careful report on his subordinates and the work done should be submitted by the Double Company Commander to his Commanding Officer at the end of the training, as this is the only real opportunity for sifting the good from the bad or useless men under his command.

5. The Commanding Officer will in addition, having previously been furnished with a programme of the training, inspect the Double Company on any days he selects, and will have an opportunity

of seeing for himself whether it is being trained in a competent manner or otherwise.

6. I append a suggested programme for three weeks' training on the lines I have endeavoured to sketch in the foregoing remarks:—

PROGRAMME SUGGESTED.

1st Week.

To be devoted entirely to section training.—Section Commanders to be held responsible for the individual training of their men in the ground work necessary for the advanced exercises they will undergo. Double Company Commanders to detail and explain each morning and afternoon's work on the ground about to be worked over irrespective of any special tactical idea, *i.e.*, each man to be put as sentry for outpost. Reconnoitring patrols, etc.; entrenchments and digging with short implement; extension, distribution of ammunition, etc., etc. In fact the rudimentary individual instruction required should be given. Mekrometers to be taken out daily. Semaphore work to be carried on simultaneously. Only blank ammunition to be issued. At the end of each practice faults to be pointed out on the ground. Double Company Commanders, Officers, and Native Officers to supervise work only.

2nd Week.

The companies to be entirely under their Company Commanders: and working against each other with special ideas for each day's work. The work done in the week to embrace every subject required for the field training of a soldier. Ball ammunition to be issued on certain days, blank on others. It will be most instructive if one company prepares a position for defence which the other will attack with ball, targets replacing the men in their positions, the defenders doing the same on the other day. The elementary preparation for the work to be done in this week has been made during the first week's work.

3rd Week.

The Double Company to act as a whole, against another Double Company if both can be struck off together. During the attack practice a squadron of cavalry and a section of artillery to co-operate by mutual arrangement. This week to be from start to finish one set of operations with special ideas dovetailing into each other; the Double Company Commander being out of action and umpire. One day to be given to the Double Company Officer. The remainder to be under Native Officers. Ball ammunition to be used in all target practices. In this week again a defensive position could be prepared

by both Double Companies—which they could both attack assisted by artillery and cavalry—the targets as before replacing the men.

During the last two weeks casualties of all ranks to be freely practised. Juniors to at once replace seniors. I have only sketched out the general drift of a programme for training; the details for each day's work must, I think, be left to Double Company Commanders to submit themselves.

A SCHEME FOR PROMOTION FROM THE RANKS OF THE BRITISH ARMY.

BY "RANKER."

The demand has already been put forward in Parliament by the rising democracy that a large increase shall be made in the number of commissions bestowed upon men in the ranks, and there can be no doubt but that some measure to give effect to the aspiration will be forced upon the consideration of the authorities before many years have passed. The following suggestions are therefore presented in the hope that the experience of a "ranker" may be of some use in considering the question.

To begin with, I am convinced that while it is desirable, and politically expedient, to promote men from the ranks, our army does not at present contain, in any number, men fitted for such advancement. The main factor in the case is that the officer is not made simply to confer upon the individual a gratifying improvement in position, but to provide the soldier with a leader. Now, as the poet reminds us, we must take the soldier as we find him, and it is no use whatever to give him officers whom he does not look up to. The relaxation of discipline that has taken place of late years, and which must be considered deplorable in view of the greater strain of modern war and the diminished facility which the modern battlefield affords to the exercise of authority, demands higher personal qualities than in the "good old days" when there was a greater gulf between officer and man. But with these qualities must be associated the personal factor—the "je ne sais quoi" of military command. This it is which causes the soldier to mentally surrender himself to the influence of his leader, and is the more important factor. Thus the aristocrat, or even the man who is merely wealthy, is potentially a better regimental officer than one who, having all else in his favour to a greater degree, lacks in himself or his circumstances anything to attract the soldier's interest. The soldier, as I know him, regards with very little respect the officer who is not, in the first place, a "real gentleman," and even the gentleman who is poor comes in for contemptuous notice if not of strong personality. I therefore think it would be a great mistake since the right class do not exist in the ranks in any numbers, to make officers of the next best thing available, namely the Colour-Sergeants and Sergeants. Most of these are undoubtedly splendid men, and as a body the backbone of the army, but the withdrawal of the best to make unsatisfactory officers would weaken the army in a vital spot, and I believe that were better conditions in quarters, pension, etc., given to those ranking as Colour-Sergeant, not one in a hundred would accept a commission, hardly even a Quartermaster's if offered. At the same time I am strongly against the idea of making a rank of Under Officer, a sort of bastard rank, the offspring of vague desire on the one hand and of scarcity on the other, which some would foist upon the army. It would certainly be

unwise to divide between Under Officers and Non-Commissioned Officers what authority and respect now attach to the latter, and it must not be forgotten that, as things are now, no further demand can be made upon the men under these heads.

For these reasons I believe that the question of promotion from the ranks must be approached in a more comprehensive way than that of merely giving stars for stripes, and that the basis of recruiting must first be broadened. This means that the men who would do very well, the well-educated but less wealthy middle classes, must be attracted to the Colours by a definite comprehensive scheme which promises, in their opinion, the chance of a career. Any such scheme must, of course, come into operation from a prospective date reasonably distant to enable the men to come forward and qualify.

The main features of the scheme recommended is that a military college for Non-Commissioned Officers should be established at or near Sandhurst, and that periodically men considered fit for commissions should be sent there for training. These men should first be required to have obtained a 1st class certificate in education, a pass certificate in a modern language, a musketry certificate, have been qualified as efficient supernumerary signallers and to have passed in subjects (a) and (b). On going to college they should live and be dressed exactly like Sandhurst Cadets, remaining there 18 months. During this time they should study military subjects and whatever language they had previously passed in, also riding; every endeavour being made to ensure enthusiasm in study as well as in never-forgotten sport. It is probable that none would have to be weeded out at this stage, the preliminaries having sufficed to show what kind of men they were. Finally, they should be appointed to regiments as full Lieutenants, with an outfit allowance and with additional pay at two shillings a day right through their service. In the cavalry, the additional pay should be four shillings, the number of officers in each regiment being reduced by two, a measure which the intelligence of modern Non-Commissioned Officers renders possible. But the essential thing throughout is that the men should be of the class to command respect, for though the working man elects "labour members" to play political garb for him, he wants none of him in any other capacity, and Atkins desires no Military Labour Members to rule him in the army.

An officer who at that time was unaware that I had passed through the mill, once observed to me that, in his opinion, men promoted from the ranks to substantive commissioned rank were not on the whole, a success. With that opinion I agreed from conviction and need not discuss the present "system" of converting Lance-Corporals into 2nd-Lieutenants, but I am sure the charge would not hold good if the scheme I have outlined were carried out; still less would our army be thereby laid open to the opinion which another gentleman (also in ignorance of my being a ranker) expressed, that the inferiority of a certain foreign army as compared with another was due to the large proportion of ranker officers in it. But he did not know much about the subject in any case.

THE VALUE OF A PERSONAL ENTRENCHING IMPLEMENT.

BY MEA.

This is a subject which is frequently under discussion and concerning which opinions appear to be largely divided. It is the opinion of some that when an entrenching tool forms part of the personal equipment of the soldier, the additional weight it entails on him out-balances its advantages.

Many kinds of tools have been suggested and tried, but no decision appears to have been arrived at as to the advisability of the entrenching tool forming a part of a soldier's equipment. One cannot do better than refer to the greatest and most experienced of soldiers, Napoleon. It was one of his maxims that "There are five things which a soldier should never be without, his firelock, his ammunition, his knapsack, his provisions (for at least four days), and his entrenching tool....."

It may be argued that what was useful in Napoleon's day does not apply to the present; that the invention of the breech-loading magazine rifle, smokeless powder, and quick-firing guns capable of tremendous destructive effect at long ranges, have revolutionised tactics. This is perfectly true, but the value of field fortification has increased with these changes. *Combined Training* says "The introduction of smokeless powder has made the question of concealment of primary importance; it is now possible for troops well posted to maintain a heavy fire without disclosing their position."

Infantry Training lays down, with regard to the occupation of a position, that "when there is no time to entrench every man must improvise cover for himself, and this should be constantly practised in peace."

It would appear then that entrenching and the creation of obstacles is more important to-day than ever it was. The present system of carrying entrenching tools on mules has many disadvantages, viz., the troops may have to scale heights where it is impossible for mules to go. When the attack is launched and the men are under fire, it is difficult to get the tools issued to them, and, having done so, the men have much difficulty in using such cumbersome implements as picks and shovels while lying down. During a night march if the mules trot, buck, or fall down, the tools rattle and the noise may give away the movement. The advantages of the present system are that a larger tool can be carried and its transport entails no fatigue on the men.

It is evident that if a man is to carry an entrenching tool, in addition to his other equipment, it must be both small and light and the greater number of purposes it will serve, the better. It would appear that neither pick nor shovel, nor a combination of the two, if made small and light enough to cause no encumbrance to the soldier, would be of any practical value except perhaps in very soft ground. The implement then that suggests itself is a form of axe

with a long head. The advantages of this description of tool are—it could be conveniently carried slung on the soldier's left, it can be used for a large variety of purposes, it is adaptable to every description of country, except rocky country where any form of entrenching tool would be useless.

In the event of every man having such an implement as a part of his personal equipment, the necessity of providing him with an unwieldy tool while under fire would be obviated; he would always have it with him whether on a hill top or in any position where it would be difficult to convey the larger tool. It would be unnecessary for a small force making a night march, when silence is so essential, to be accompanied by mules carrying entrenching tools, and it would add confidence to the soldier since he knows he has always the means of providing some sort of cover for himself.

The uses of such an implement are many. It can be used by the soldier while lying down to scrape up enough earth to protect him while in that position.

In operating in a woody country it can be used to cut down branches of trees to form a barricade, obstacles, or temporary shelters. It is useful for cutting sods for revetments or for cutting firewood or wood for bridging, etc. It could also be used for constructing temporary latrines and for many other purposes.

If operating in a country where trees are plentiful and every man is in possession of such an implement, it should be unnecessary to carry any form of tent, as temporary shelters can easily be constructed out of a few branches and some grass or by putting sods on the branches of trees. This is a great consideration in these days when saving in transport is so important.

It is not intended that such an implement should altogether take the place of the entrenching tools at present in use, as the latter would of course be more useful for digging trenches, etc., when not actually under fire of the enemy. The idea is that it would be of infinite value when the pick or shovel is unavailable or unadaptable.

The weight, shape, and size of such an implement can only be decided after careful and thorough experiments; it should be subjected to many severe and varied tests until the most desirable pattern is arrived at. It might be carried in a leather case attached to the belt.

There is little doubt that some such implement will form part of every soldier's equipment before long and, since it must cause an additional weight and some small discomfort while on the march, it is important that the best results should be obtained.

When once the soldier has discovered the advantages of this tool he will recognise that it more than compensates for the discomfort which its carriage entails, and it will become for him what the claspknife is to the sailor.

Every man naturally considers his personal comfort and the soldier is no exception to this rule. Having seen that the possession of an axe affords comfort in many ways every soldier will cheerfully carry one as part of his personal equipment.

NIGHT OPERATIONS DURING RUSSO-JAPANESE WAR

BY 2ND-LIEUTENANT T. F. O'MALLEY, ROYAL MUNSTER
FUSILIERS.

There are many military writers of to-day, who condemn night marches as the result of over anxiety to spare those troops engaged in them. However, it has been found that in the open plains of southern Europe and in tropical climates, even if only to avoid the heat of the day, an army must make repeated night marches to draw near to the enemy's position.

We will see, if we read through and study the details of this last great war, that night attacks which were formerly almost exclusively confined to siege campaigning, have now taken their place as ordinary occurrences in field warfare. As regards siege campaigning Port Arthur has given us excellent examples of operations carried out by night against a fortress. The partial destruction by night of the Russian fleet anchored in the roadstead at Port Arthur by Japanese destroyers at the commencement of the war. The capture of 303 Metre Hill after repeated failures by day. The frequent sorties by the Russians who often and often destroyed the Japanese mines and earthworks which were in dangerous proximity to their position. The many Japanese assaults made under cover of darkness on the forts around Port Arthur.

Whenever great masses of men had to be brought up close to the enemy's position, the Japanese on practically every occasion used night marches to cover their movements and effect concentrations. In the battle fought at Liaoyang which lasted from the 28th August until the 4th of September 1904, the Japanese approached the Russian position mainly by night marches made on the nights of the 28th and 29th. On the 29th the march which was suspended during the day was continued at nightfall so excellently that the Japanese 5th Division got to within decisive range of the Russian position, intrenched there, and delivered their attack the following day.

As regards concentration with reference to night operations one cannot do better than to refer to the battle fought at WAFANGU on the 14th and 15th of June 1904. On the 14th the Russians more than held their own but on the 15th the Japanese having concentrated a battery of 108 guns opposite the Russian right, during the preceding night, silenced the latter's artillery and so paved the way for the turning movement which had already commenced: without these guns it is very doubtful whether the movement would have succeeded.

To turn to the use made by the Russians of night operations in the above mentioned battle: under the cover of darkness, on two successive nights they retired on VANZELIN and it was in this way that most of the Russian retirements in subsequent battles were carried

out after the defeat at Liaoyang; the Russians, a report tells us, held on to a few points to enable them to carry out their retreat at nightfall.

It has been said that night operations should not be used because of the lack of control, the dreaded result of losing your way and so probably being found at daybreak by the enemy either in a precarious position, or so far away that you cannot act in conjunction with the other forces who may have already begun the attack.

At Liaoyang the 3rd Division of the Japanese army could not, on account of the impenetrable tangles of millet combined with the darkness, get nearer by daybreak than 2,000 paces from the Russian position and so could not co-operate with the 5th Division which had commenced the attack. Night operations during the war were by no means uniformly successful; innumerable Russian reconnoitring parties advancing by night at the Shaho and at Mukden were surprised by the Japanese and thrown into confusion for men are liable to be thrown into disorder much more readily at night than by day.

There is not the slightest doubt that when an army of the present day is before a fortress or facing an enemy which in these days may be defended by semi-permanent fortifications, like the Russian positions were at TELITZE, MUKDEN and the SHAHO, such an army cannot even move its artillery by day without subjecting it to great losses. At TELISSU the Japanese artillery endeavouring to support their infantry in the attack had all the horses of some batteries shot.

Often when the Japanese attack had failed time after time by day, the assault was carried out successfully by night. A good example of the above was the action of the 5th Japanese Division at Liaoyang during the day of the 30th. They repeatedly attacked two hills but were driven back; at night fall, however, they captured them, but not before they had been taken and retaken three times.

The Japanese did not use night operations unless an attack by day had failed or when the losses incurred by an assault of the enemy's position during day light would have been too heavy.

Having approached the enemy's position under cover of darkness the attack usually commenced at daybreak; although on the 13th and 14th of October 1904, the grand assault was carried out by night.

"The Japanese utilise the ground by day and night," a Russian report says, "in an ideal manner," and their advance by night was carried out in the following manner.

The ground having been carefully reconnoitred in front, the 1st line advance some hundreds of yards and dig trenches: when a certain amount of cover is dug scouts are again sent forward and, if there are no signs of the enemy, the 1st line again advances some distance and digs trenches, the 2nd line at the same time occupies the first trenches and makes them almost perfect, and so on, until the Russians stopped them or when they get within decisive range from which position they attack at day break.

To march and attack by night, to remain in earthworks by day, such are the characteristics of the tactics which have been forced upon us by modern weapons.

Night attacks must and will certainly become common, artillery will be used, although one of the chief characteristics of the last war was that by day artillery was predominant and by night infantry.

An army of the future should be well supplied with powerful search-lights, starshells and other mechanical appliances and then excellent practise may be carried out by artillery at night.

The Russian artillery practice on the Shaho was almost as good by night as by day, but this was because both armies were practically stationary and sheltered behind semi-permanent fortifications.

Genius recognises rule and studies experience, but uses its knowledge in its own way and time and if a combination of brain-power, cohesion, and concentration with individuality is applicable to day manœuvres still more so is it applicable to night.

THE EMPLOYMENT OF CAVALRY IN THE RUSSO-JAPANESE WAR.

Translated from the Supplement to the "Internationale Revue
über die Gesamten Armeen und Flotten" of May 1907.

BY CAPTAIN C. J. B. HAY, *p.s.c.*, Q. O. CORPS OF GUIDES.

The literature of the Russo-Japanese War is prolific, and not a few *critiques* lie in front of us, which deal with instructive experiences arising from events in that campaign. It is therefore striking how comparatively little the activity and performances of the cavalry are thought about, and how seldom the question is put, what conclusions can be arrived at in the domain of cavalry for the future employment of that arm from the campaign of 1904-05. As a reason for this superficial, and very frequently inadequate and insufficient, judgment of the cavalry, one finds even in serious *critiques* the brief allusion that this arm did not do much on either side and found no suitable field for its activity, and that in consequence it was impossible to make instructive observations or to draw decisive conclusions. This argument is nevertheless most astonishing, for we shall subsequently see that, on carefully reflecting on the course of events during the war, the cavalry was not so inactive throughout as is often assumed, and that very many lessons worthy of notice can be deduced from their positive as well as negative performances.

The greatest error that the Russian leaders made before even the outbreak of hostilities, and which continued throughout the course of the campaign, was notoriously the under-rating of their opponents. It is also said that the most influential authorities could not bring themselves to and did not deem it necessary to detail a sufficient proportion of the good regular cavalry present in European Russia—Guards and Dragoons—for the theatre of war in Asia. Only three regiments were sent out, of which, it may be added, the 51st and 52nd Dragoons only reached their destinations in the 17th Army Corps area at the end of July 1904.

How blameworthy the action of the army leaders was in not devoting more attention to the employment of their best-trained and most reliable cavalry, was most conclusively proved by both these regiments of Dragoons. For they succeeded in what the Cossacks up till then had had extremely limited success, namely in thoroughly clearing up the situation as regards their opponents, and also, amongst other things, during the battle of Liaoyang in locating the movement to the right of Kuroki's army and its crossing to the other bank of the Taitse Ho above Liaoyang.

In place of regular cavalry were detailed to the field army only portions of the numerous bodies of Cossacks which are at the disposal

of the Russian Empire, and it was quite taken for granted that their hardy horses, easily satisfied with frugal fare, would be admirably suited to the peculiar climatic and local conditions of Manchuria. This assumption might, perhaps, have proved correct had the military authorities detailed the flower of the Cossack soldiery to take part in the campaign. But of the Orenburg, Ural, and other Cossacks, who formed the major part of the cavalry in the theatre of war, and up to the end of the autumn of 1904 had reached a strength of 207 sotnias, more than half were composed of men of the second and third "category." In foreign departmental circles, too, it was no secret before the outbreak of the campaign that at the most the Cossack Regiments of the Don detailed for the European Cavalry Divisions would only be able to meet half-way the demands which are made of a body of horsemen of the present day.

For some years a perceptible lack of horse-flesh had made itself felt in all the Cossack districts. The men coming in for service with the colours, on whom from time immemorial the obligation had been imposed of bringing with them their own horses and weapons, found themselves no longer able to do so. The responsibility for remounts had, therefore, to be undertaken by the Government. In this such difficulties presented themselves that the mounts of the Cossacks, especially those of the second and third "categories," left much to be desired. Such being the condition of affairs it is not easy to understand how the Army Commanders could pin all their hopes as regards cavalry on the Cossacks alone. To exculpate them, the fact may, perhaps, be brought forward that the reports about the 35 sotnias, which were present with the 1st, 2nd and 3rd Siberian Army Corps at the outbreak of the war, were worded in particularly favourable terms, and thus the military were strengthened in their opinion that these troops were doubtless best suited to carry out the duties of the cavalry in the theatre of war.

That this opinion of the capabilities of the Siberian Cossacks was not altogether at fault, is evidenced by a most interesting corroboration in the diary of Colonel von Csicseries, who was with the staff of General Kuropatkin during the last days of the battle of Mukden. Herr von Csicseries here remarks that the greater part of the men had taken part in the disturbances in China, and had consequently "become men inured to war, to whom a life in the field afforded visible pleasure. An astonishing bump of locality, adroitness and dexterity in cross-questioning the inhabitants, these were the most prominent qualities of these Cossacks who, if they had been correspondingly educated, would have been able to accomplish even brilliant performances." But it was in this very question of education that most of the bodies of Cossacks were lamentably deficient. First of all thrown together of necessity at the moment of the commencement of the war, then gradually expanded and improved, they started partially unprepared, neither properly drilled nor instructed, for tasks and conditions which only troops trained to a high pitch of perfection could perform.

In St. Petersburg they gave credence to the existing deficiencies, which, as time went on, became more and more apparent in the Cossack troops, and in order to remedy these to a certain extent officers were appointed to them from the Guard and Line Cavalry Regiments. But the lack of homogeneity in the corps of officers, which resulted from this, only increased the faults of an organisation deficient from the commencement, and rendered it more difficult to carry on.

To add to all this, there was a lack of suitable personalities in high places to assume the rôle of cavalry leaders, and impart their knowledge and power to troops who were not yet fully prepared. Therefore the many services, which General Rennankampf for instance performed, and also the personal ability of Generals Mischenko and Samsonoff, should not be under-rated, but with the quite inadequate support which was afforded them by the troops under their command, even they were not equal to the stupendous tasks which were imposed on them from all sides.

So it is seen that in this war it has been proved once again, and that to a high degree, that nothing great can be accomplished with improvisations of cavalry, and that cavalry especially when incorporated in divisions, if it wishes to be led to high aims, cannot be stamped out of the ground immediately before great events.

Cavalry to be of use should already in time of peace have lived with their leaders, should have learnt together what their action should be in war, and should ever bear in mind that very frequently the most vital crises and results depend on their successes.

The organisation of the Japanese cavalry too proved to be faulty, quite apart from the consideration that from the point of view of numbers it was scarcely in a position to meet all the demands which are made of a body of modern cavalry. At the commencement of the war Japan disposed of one Guard and sixteen Line Cavalry Regiments, of which to each of the thirteen divisions of the field army a regiment of three squadrons was detailed, while the three remaining Line Regiments were first of all organised in two Brigades, and later on, before the battle of Mukden, in a Division. When in the course of the campaign a number of Infantry Reserve Brigades were raised, each contained a reserve cavalry squadron in its organisation. It appears to us that the leading commanders in the Japanese army, in view of their notorious lack of cavalry, would have acted more advantageously to their own interests if they detailed to each Infantry Division only one or at the most two squadrons as divisional cavalry and had organised their remaining cavalry into brigades and divisions.

In the reconnaissances admirably organised by the General Staff, and in the battles of position which were so great a feature of this war, fewer numbers than those actually at their disposal would have been employed with individual divisions in the services of exploration and security. The cavalry thus set free for higher organisations might then, under, skilful leading, especially on the Japanese left flank and with the lie of the country which was here so favourable

have found numerous opportunities for far-reaching enterprises and more than once have threatened the lines of communications of the Russians. And that Marshal Oyama might have turned the defeat of the Russians at Mukden into a complete rout, if, instead of a single cavalry division whose head had reached the railway line Mukden-Tieling by the 3rd March, he had had several at his disposal, is openly stated from the Russian side in the latest book on the war, namely that by General Kuropatkin.

When one thinks of the prudent, far-reaching preparations for the war taken by the Japanese Government, and realises how excellently on the whole the army was organised, trained, and armed, it must then at first sight appear really astounding how neglected and backward the cavalry was in comparison to the other arms. In extenuation for this it may be advanced that the ordinary conditions for the employment and training of cavalry are not altogether favourable in Japan. Impracticable mountainous country on the one hand, and ground cultivated up to the last possible foot on the other, allows of next to no freedom of movement. Horse-breeding too is but little developed in the island empire.

Quite apart from the difficulty of getting sufficient pasturage in a country so over cultivated, the soil which is strongly saline only yields a most inferior kind of green fodder.

Thus before the war began the cavalry, even weak as they were, could not make good their deficiency in horse-flesh in their native country, but were forced to mount themselves almost exclusively on water ponies, but little suited for the purpose. In addition to the unfavourable configuration of the country and the lack of horse-flesh, matters which hinder the training of the individual as much as that of troops, and which cannot be called advantageous for the organisation of the larger cavalry formations, emphasis must also be laid on the fact that the Japanese with their extremely short legs are by nature but little adapted for the rôle of cavalry soldiers, and thus the interest of the army authorities in the cavalry arm is not particularly stimulated. Finally they must have been to a considerable degree influenced by the well-known fact of the numerical superiority of the Russian cavalry, and so avoided starting off with a number of improvised cavalry formations at the outbreak of the war, deciding to keep their few cavalry, generally speaking, in the settled formations and organisations in which they had been trained in peace. One cannot finally reproach the Army Commander strongly for adhering to these principles, when it is perhaps probable that the army had in its ranks more doughty cavalry leaders of the calibre of Generals Prince Kanin, Tamura, and Akijama, who in this way were enabled to prove their talents.

But what the Japanese cavalry soldier lacked in horsemanship, was compensated for by his intelligence, his resourcefulness in the field, and his good training in shooting. In the war against Russia the cavalry most emphatically proved that it was possessed of these qualities. Repeatedly, in the orders of the day and in the proclamations

of the Army Commanders and of the Commander-in-Chief, there were references to the excellent information and reports which reached them from reconnoitring detachments and patrols, and on one occasion Marshal Oyama categorically stated that, without the help which had been afforded him by the cavalry, he would have been groping in the dark in the measures he was at that time undertaking. Particular attention must be drawn to this fact here, because, in the literature which treats of the Russo-Japanese War, the statement is made repeatedly that the Japanese Generals had to thank the already-mentioned and certainly admirably directed system of espionage and intelligence almost entirely for the good information which they obtained. No doubt this excellent organisation did very excellent service for the whole army, and often contributed to the successes gained, but it would be considerably disparaging the performances of the cavalry in the service of reconnaissance, if it were conceded that they were excelled in this by spies.

During the campaign the Japanese cavalry fought to a considerable extent on foot, and that indeed not only in independent operations, but frequently in combination with their own infantry. It is an especially striking feature of this war how often, on the side of the Japanese, the cavalry fought dismounted shoulder to shoulder with the infantry. The fact is accounted for by the limited amount of training in riding (which has already been shortly alluded to) of the Japanese cavalry, who could not be set an independent task of any magnitude or allotted any great activity on the field of battle. Their numerical inferiority, too, and, at any rate at the beginning of the operations, their evident awe of the masses of Russian cavalry may be taken as the reason that the cavalry detachments did not venture very far afield, and that frequently infantry followed them, on whom they fell back, and with whom they made common cause when the enemy appeared in superior force and pressed them back.

Captain Count Wrangel of the Cavalry of the Austro-Hungarian army, in his very interesting *brochure* entitled "The Cavalry in the Campaign in East Asia," sets forth a number of cases, in which the Japanese cavalry fighting on foot contributed towards victory. Thus General Akijama with the 1st Cavalry Brigade under his command joined in the battle of Wafangkao at a most opportune time, in order to stem the attack of the 2nd Brigade of the 35th Russian Infantry Division (commanded by Major-General Glasko), with his men fighting dismounted. By this act he relieved the 3rd Japanese Division who were in danger of having their right enveloped by the enemy's advance, from a most critical situation.

When the eastern flank of the Russians was compelled soon after to beat a retreat on account of the general situation on the battlefield, the Japanese Cavalry Brigade prosecuted an energetic pursuit, and even forced the opposing rear-guard out of their strong position at Taitsyatun. All this was dismounted action, and the losses they suffered were strikingly insignificant.

In the battle of the Sha Ho the 2nd Independent Cavalry Brigade under Kotohito-Kanin by their fire-action helped the few troops left in reserve to repulse Rennankampf's attack on Bönsiku, which was being carried by superior forces. Akijama's cavalry, too, defended the village of Sandepu for whole days against the impetuous attack of the Russian infantry. It is worthy of note that they made use of their explosive cartridges as missiles.

Nothing has come to light in this war of any real activity on the battlefield of the Japanese cavalry as a whole, and one must therefore take count of the little hand-to-hand fight in the battle of Wafangkao between some *sotniks* of Cossacks of Samsonoff's Brigade and the cavalry of General Akijama, in which the former are said to have made good use of their lances. We have already given the reason why the Japanese cavalry did not accomplish more in this field. On the other hand stress ought to be laid on the fact that the Japanese, in spite of the defects under which their cavalry laboured, on several occasions showed that they understood how to break in upon and do damage to the lines of communication of the Russians by means of cleverly planned and equally cleverly executed raids. For example, on February 12th, 1905, two squadrons succeeded in getting in rear of the Russian army, and in partially blowing up the fortified railway-bridge at Fantsiatun, north of Guntsuling. The result was that a sort of panic broke out in the Russian Headquarters, and General Kuropatkin caused a whole brigade of infantry and the division of Cossacks of the Don to be sent back to the north as a protective measure. Rich in interesting episodes, too, are the enterprises of the detachments commanded by Majors Naganuma and Sasegawa. They were composed of 150 men each, 75 picked men and horses being contributed by each Cavalry Brigade, and a Captain by each regiment. The task of these squadrons was to advance independently to the railway line, Mukden-Harbin, and to destroy the railway thoroughly, as well as to spread a sense of insecurity in the enemy's rear. It is most improbable that these squadrons were able to make sure of co-operation with the Hun-Hutzes. The two leaders were presumably told the moment when the destruction of the railway would be most effective.

Sasegawa's detachment succeeded in destroying the railway on the 25th February at Bodniö, 150 *kilometres* (about 94 miles) south-west of Harbin.

Major Naganuma's detachment united on the 9th January at Sumapano, not far from Heikautai; the next day passing close to the regiments of the Russian cavalry leader, Mischenko, which were marching in a south-westerly direction, with the intention of destroying the railway-bridge over the Hsinkao, south of Shangshun and 256 *kilometres* (160 miles) north of Mukden. Supply vehicles were not taken, each small body had to live on the country, and each cavalry soldier carried in his haversack seven days' rations of compressed rice. In forty-three days the small detachment, at a temperature of from 25 to 30 degrees Celsius, covered a distance of

480 kilometres (300 miles), the first portion of the ride being accomplished for the most part by night. Man and horse were fit throughout. The sudden appearance of Japanese cavalry, who had apparently interchanged with the Hun Hutzers, had prevented the Russians from taking counter-measures in time. The destruction of the railway-bridge over the Hsinkao was accomplished on February 11th.

With this their task was finished, and now their leader decided to return at once to the army. On the night of February 14th the Japanese succeeded in repulsing the attack of two *sotnias* of Cossacks, with two guns and, what is more, in capturing one of the guns. This encounter together with the announcement that the destruction of the bridge had been carried out by a strong force of Japanese cavalry caused Kuropatkin to withdraw cavalry from his right flank, and send them back from Mukden to Shangshun. The Japanese succeeded in eluding them, and after an absence of sixty-three days safely reached their own army on March 13th, just as the battle of Mukden was being decided in favour of the Japanese.

We cannot withhold our appreciation of the Japanese cavalrymen. They grasped their task clearly, and carried it out without letting themselves be stopped by side issues; attention was paid to sparing their horses, and in this way a great success was attained. It shows what even numerically weak cavalry can perform in the face of superior numbers, when commanded by an energetic leader.

As a contrast to this one of the largest enterprises, which was undertaken on the Russian side by General Mischenko, is rich in lessons on account of the many errors committed. 66 squadrons, 5½ batteries, 4 machine guns, and 4 sections of mounted infantry (mounted scouts from different infantry regiments), united on the 8th January 1905, Sakudiapu, 20 kilometres (12½ miles) south-west of Mukden, in order to set out on the ride under the orders of the popular cavalry leader. A detachment of Pioneers, a section of a bridging train, and four *sotnias* of mounted Frontier Guards, as well as 1,600 pack animals for the conveyance of the means of subsistence, were finally added to the command. The best cavalry in the Russian Army in Manchuria—3 regiments of Cossacks of the Don and 3 regiments of Dragoons—took part in the raid, a circumstance which must not be overlooked when passing judgment on Mischenko's performances. The primary object of the General was to surprise Inkau, a post on the line of communications, and to capture the supplies which are supposed to be there. The leader overlooked the fact that, since the harbour had been frozen over, it had lost its importance, and that by this time all additional supplies for the Japanese troops were sent *via* Dalny. The destruction of the extremely important railway line, Port Arthur-Liaoyang, which ought to have been the chief objective of the expedition,—as subsequent to the fall of Port Arthur it was necessarily of the very greatest importance for the forward march of

General Nogi's army,—only occupied a position of secondary moment in his eyes.

Although the progress of the force, which was divided into three columns, retarded as it was by Hun Hutzes and small detachments of Japanese infantry, was only very gradual, and did not average more than 29 kilometres (about 18 miles) *per diem*, still the situation was not an unfavourable one when Niuchwang was reached on January 12th. Even if only a moderate amount of energy had been expended on the object in view, it ought not to have suffered any great hardships, if the march had been resumed the same day in order to attack and seize Haitshön, which was alleged to be occupied by 1,500 Japanese infantry and artillery. This task could have been accomplished by 8,500 cavalry with 34 guns.

But even if they wished to avoid the losses, which the capture of a fortified place must always entail, Mischenko's columns might at least have been sent out to various places as far as the railway—when the latter might have been lastingly damaged. Instead of this the leader of the detachment unconcernedly adhered to his original project of the capture of Inkau. The railway station was then, aided by great good fortune, stormed by 12 *sovnias* of different regiments, dismounted, and some magazines burned. In the meanwhile strong officers' patrols did some insignificant damage to the railway lines, Inkau-Taschichao and Taschichao-Haitshön. These were the sole results of a raid organised with such waste of strength.

On January 17th, Mischenko's cavalry returned to the Russian lines. They had lost 7 officers and 71 men killed, and 32 officers and 257 men wounded. The raid, even indifferently carried out as it was, had certainly spread unrest far afield, and had caused the Japanese Generals to detach troops from the field army for the protection of isolated localities, which remained withdrawn during some days of the operations, but what did it matter if these few battalions were away, when it was a question of such huge armies? The material damage done was only small. If the cavalry had really wanted to be of some use to their army, then they should have remained concentrated, stayed for some time on the neighbourhood of the railway, and made efforts to possess themselves of the line for some hours.

General Mischenko from the first lost sight of his main objective; wherever so small a chance of success offered, he went after it, without stopping to enquire whether the game was worth the candle. As has already been pointed out, the expedition to Inkau, on the news that the magazines there were insufficiently protected, was quite a mistake. Even when these few magazines were actually destroyed they were easily enough filled again. What was accomplished by this numerous force could have been equally well done by single regiments, or even by strong patrols.

The protection of the country through which the lines of communication pass by means of flying columns, as organised on the Japanese side, proved effectual.

Just as the Russian cavalry failed in this big enterprise, so it was the case on nearly all occasions in the service of reconnaissance, whether it was a question of large or small, weighty or less important missions. The error lay, as has already been once briefly mentioned, in the faulty training of the troops in peace, in the failure of pedantic, old-fashioned, and narrow-minded cliques, and in the deficit of sufficiently numerous and suitable books of instruction and guidance, which might to some extent at any rate have compensated for neglect.

In this respect the Commander-in-Chief deserves less blame; during the course of the war General Kuropatkin issued a series of injunctions to his cavalry, which without a shadow of doubt contained very pertinent remarks, and prove that he had a right conception of the very important duties of the cavalry arm. A memorandum, which he published on April 15th, 1904, from Liaoyang to the troops under his command, runs thus: "There are many cavalry leaders who well understand how to lead their cavalry to the attack and to re-assemble them after the shock. But this capacity is useless, if the employment of the cavalry in this way does not accord with what the army is doing as a whole. Therefore cavalry leaders must clearly realise that their whole *rôle* is merely one of support, and should never be directed simply for their own ends. From this it follows that it is essential to provide the army corps and other leaders before everything with information, above all judicious information, to enable them to come to decisions and act. . . . We must make the most advantageous use of our numerical superiority in cavalry against the Japanese. Before everything it will be important to destroy the Japanese cavalry, or force it to inaction. It will next be the task of our cavalry to find out accurately the movements of the main bodies of the enemy: to follow closely their intentions and measures up to the moment of actual collision, when the cavalry will take up the duty of tactical reconnaissance, and of scouting on the flanks of the enemy and of minutely observing all movements.

"A well-led cavalry still has opportunities, even in decisive moments of the battle, and at all events in the pursuit, of throwing their fighting strength into the balance by attacking."

If the Russian cavalry had always modelled themselves on these instructions of the Commander-in-Chief, if they and their subordinate leaders had continuously kept definite aims before them and had steadfastly and adhered to these, in order to overcome the many difficulties, which, next to the faults in organisation and training, the country and frequently the conditions of the weather placed in their path, then better results and more stirring deeds of arms would have been the outcome, than as a matter of fact was actually the case.

At the commencement of the operations it almost seemed as if good results were to be anticipated on the part of the cavalry, and as if the ordinary observations regarding the tasks of the cavalry, issued by the Commander-in-Chief, were understood and being

attended to. For General Mischenko with much wariness and great skill had not only established the advance of Kuroki's army from Anjou towards the Yalu, but had even contrived to delay it for several days. However, even as soon as in the battle of the Yalu the reconnoitring of the Russian cavalry proved quite ineffectual, inasmuch as General Sassulitch was absolutely and entirely surprised by the turning of his left flank, and barely escaped total annihilation. After the battle of the Yalu Kuroki continued his advance in a north-westerly direction without energetically pursuing the retreating Russians. The position and strength of this army was nevertheless not sufficiently established by the Russian cavalry, who were hanging on either flank. In no less dangerous predicament as that on the Yalu was General Stackelberg's column at the end of May 1904, when it was engaged with the main body of General Oku's army, and was left completely to its own devices by General Samsonoff's attached cavalry brigade. In exculpation the Commanders urged that on account of the general mountainous character of the country and the numerous *kuoliang* fields they could make no progress, and that they had on this account lost touch with the enemy.

It goes without saying that these reasons could not be regarded as anything but insufficient, and it must be noted as unpardonable that the service of reconnaissance here failed so signally that the turning movement of the Japanese left column was not announced. By this unlooked-for attack General Stackelberg was brought to such straits, that it would seem to be almost a miracle that he came out of it with a loss of only 130 officers, 3,500 men, and 16 guns, for, had the Japanese made a more determined onslaught, and pressed harder in pursuit, he must have been utterly annihilated.

Nor later on in the course of the campaign is there anything worthy of praise to be related of either the service of security or of the service of reconnaissance of the Russian cavalry. On the left flank of the Russians the difficulties of the country became markedly more accentuated, especially as from lack of provisions either very few or no mountain guns at all could be detailed to accompany the detachments of cavalry, and on practically all the important highroads dismounted Japanese cavalry with detachments of infantry following up behind were encountered. On the right flank of the Russians, however, in the plains, the cavalry had to undertake quite another rôle. Simonoff's Siberian Cossack Division and the Cossack Division of Orenburg, which from the beginning of July 1904 onwards had the 2nd Japanese army (General Oku) in front of them, have grave sins of omission down to their account. Even the forward movement for the concentration of the three Japanese armies, which were commanded in person by Marshal Oyama during the period August 5th to 24th, leading up to the great battle of Liaoyang, almost entirely escaped the notice of the numerous squadrons of Russian cavalry. In this case the requisite observations should have been made by means of wide movements out from the right flank against the flanks and rear of the Japanese.

During the actual course of the Battle of Liaoyang, a fact to which we have already drawn attention, they were not so inactive, inasmuch as the threatening advance of General Oku's army was early noticed and announced by the Brigade of Dragoons of the 17th Army Corps. But by some mischance, the reason for which has not yet been cleared up, the information reached Headquarters so late that Kuropatkin was unable to take any further measure to render the situation more favourable to himself. Otherwise at Liaoyang, too, the Russian cavalry did not distinguish themselves in the service of reconnaissance, as for instance, the wide movements of the enemy with a view to enveloping the Russian left flank were entirely unnoticed.

The battle of Liaoyang, as is known, ended in the retreat of the Russian army on Mukden where the bulk of it was assembled on September 7th. The Japanese had discontinued the pursuit on September 9th; a somewhat lengthy pause in the operations then ensued, until Kuropatkin resumed the offensive on October 5th. In spite, however, of this four weeks' cessation of hostilities, the Russian cavalry did not succeed in obtaining more accurate information regarding the grouping of the Japanese main forces.

It is true that Samsonoff's and Rennankampf's Cossack Divisions were sent out on extensive and important reconnaissance, but they returned nevertheless with negative results, for they encountered superior forces of the Japanese at Pianyupusa, by which they were driven back in a northerly direction.

When, then, Kuropatkin set out on his long-looked-for forward movement, every one believed and hoped that his numerically superior cavalry would now at last play their proper part for once. The possibility of turning this superiority in numbers to good account was put out of count at once by dividing and splitting up the forces available.

In addition to Mischenko's, Samsonoff's and Rennankampf's Divisions, which had been despatched on independent missions, Kuropatkin still had 143 squadrons at Headquarters. Of these 22 ordered to the western part of the army, 16 to the centre, and 15 to the eastern, while 38 were retained with the main reserves. Besides these, 52 squadrons were detailed to the 8 army corps. But these 52 squadrons, averaging therefore 7 *per* army corps, were completely lost to the service of reconnaissance, for they were employed as sentries for the staff, for post and other orderly duties, etc.

This hardly credible frittering away of the cavalry is all the more difficult to believe as the mounted infantry scouts were present with the various army corps. Only by such a squandering of the great numbers of cavalry is it at all to be explained that they did next to no reconnaissance work in the battle of the Shah Ho from October 11th to 18th.

We have attempted so far to give a short critical account of the performances on both sides of the cavalry in the service of

reconnaissance and in the larger enterprises against the lines of communication, and it now only remains for us to examine the activity of the cavalry on the battlefield, and to see from this what instructive lessons are to be drawn in this field.

In this connection conclusions are of all the more interest as views of the present day are nowhere so much at variance as in respect of the possibility of cavalry interposing in the battle by means of a charge and thereby contributing to the result of the day. But the Russo-Japanese War, as is the case with the other methods of the employment of cavalry, as we have already seen above, can only contribute its *quota* to the solution of this weighty question, chiefly by means of somewhat negative results. For on no single occasion has it transpired that either the Russian or the Japanese cavalry was able to accomplish a positive success by means of an attack. The reasons for this, in this case also, may be found in faulty peace training, and in the lack of suitable leaders.

But to draw the conclusion from this inactivity and incapacity that no suitable moments can occur for cavalry, because in this war they did not happen to take advantage of one, and they are unable to gain a success on the battlefield on account of the fire-power of modern weapons, would be a great error, and would be taken an insufficient knowledge and review of events.

The most instructive example of what the Russian cavalry, given skilful leadership, good training, and an organisation corresponding to the end in view, might have accomplished on the actual field of battle, is afforded by the battle of Liaoyang. On August 31st, between 7 and 8 p.m., the attack of the 2nd and 4th Japanese Armies, including as it did the last fresh troops (3 Reserve Brigades), failed against the main line of defence south of Liaoyang. The storming column of Generals Oku and Nodzu, which had been launched against the position, beat a retreat, absolutely exhausted and having suffered the most severe losses. On the Russian side the cavalry at their disposal were Samsonoff's Siberian Cossack Division with 19 squadrons and 6 guns, the Trans-Baikal Cossack Division with 21 squadrons, and the Ussuri Cavalry Brigade with 14 squadrons and 6 guns. But in consequence of the most unfortunate dispositions that had been made not a single one of these 54 squadrons was at hand when wanted. If this mass of cavalry had been employed from August 28th to 31st with the object of reaching the railway-line in rear of the Japanese somewhere near the station of the Shah Ho, riding round the left flank of the enemy to attain this object, then they would almost certainly have been able to be used, at the time described above, in an attack on the retreating infantry of the enemy. Had this attack succeeded, General Oku would not have been able to carry out his night attack, which was really a continuation of the former one. One can therefore only agree with Count Wrangel in his interesting book, of which mention has already been made, if he means that, if the great cavalry masses of the Russians had been employed concentrated on the right flank,

the result of the battle of Liaoyang might have been changed into a defeat of the Japanese. At no other of the later battles of the entire campaign did such a favourable opportunity for attacking present itself to the entire Russian cavalry, as was the case at Liaoyang. In spite of this, however, in the last stages of the battle of the Shah Ho, an enterprising Russian cavalry leader might have more than once found an opportunity for an attack with far-reaching prospective results on the thin ranks of the enemy, who had been struggling day and night and were tired to death. That the Japanese cavalry towards the end of the battle of Mukden were in a similarly advantageous position to turn the retreat of the Russians, which partially degenerated into a wild flight, into an absolute rout, but that they did not, however, notice this possibility, is a circumstance to which we have already alluded.

If we sum up all the results of the Russo-Japanese War in which cavalry are concerned, we must continue to lay emphasis on the fact that these results, unfavourable though they may be, offer us many instructive lessons. One must especially beware of the conclusion, which one frequently sees drawn, namely, that the war has shown that the decisive action of cavalry on the battlefield has died a natural death. It is therefore unnecessary and an aimless waste of time, it is said, to practice shock tactics on infantry with a large force of cavalry, and particularly to afford on manœuvres opportunities of a kind which, as the question under discussion has taught us, can never again present themselves in reality. We have endeavoured to explain the reasons why in the Russo-Japanese War the rôle of the cavalry, especially during and after a battle, did not turn out to be what we expected and demanded, and we still adhere as formerly to the view that in wars of the future a well-organised and energetically led cavalry even in the largest formations will be able to find opportunities of having a considerable say in the final decision. The preliminary condition for this is thorough, regular training in peace from small units up to cavalry divisions, which latter should not be got together for the first time when war is actually going on, but must be raised in time of peace in sufficient numbers, and, further, an absolute guarantee in the decision of the cavalry leaders regarding the "how" and the "when" of the disposal of the troops under their command. Only in this way shall we be following the right line with our cavalry, costly and difficult to replace as it is, and learn more and more to recognise that our manœuvres with their frequent attacks in mass are not correct, that on the contrary the adroit seizure of a single timely moment renders a cavalry assault on infantry an eminently dangerous proceeding to the latter arm. In these conceptions, moreover, a fact which should not be overlooked, the cavalry of our western neighbours believe more and more. With very special care in that quarter will the choice be made of the leaders of the 8 cavalry divisions which are now ready in time of peace, and a fact which concerns the President of the Cavalry Committee who every year has to

direct the great cavalry manœuvres, it is known that the greatest demands, mental and physical, will be made of him.

At the present moment this post is filled by General Burnez, of whom it will be remembered how short and precise were the instructions which he issued last year regarding the value and significance of skilfully-led attacks in force on infantry. This year again the 8 French cavalry divisions are being brought together, and we cannot too often lay stress on the fact that the greatest attention must be paid to the details of them on our side.

Although, however, we have expressed the view that, in spite of the negative results in the field in the Russo-Japanese War, in future the activity of cavalry on the battlefield will in no way be excluded, but that it will be able to play an important rôle, still we do not scruple to declare that the chief value of the cavalry arm must be sought for in the service of reconnaissance and in independent enterprises against the lines of communication of the enemy. In these duties fully satisfactory results can be obtained when all factors, which are requisite for the carrying out of such great tasks and which are composed of the most suitable organisation, the most complete equipment and armament, as well as the most careful training, above all in training in musketry and field work, find in all cases the attention which is their due.

A very great deal has been written of late about all these questions, and the interesting lecture, entitled "Concerning the Organisation and Training of Cavalry for Modern War," given by Lieutenant-General von Bernhardt to the military society, has treated of them so thoroughly that there is scarcely anything new left to be mentioned. We limit ourselves therefore merely to examining some points of equipment and armament, which appear to us to require a little fuller treatment, if, in virtue of the latest lessons of the war, one wishes to make the cavalry quite independent in order to be able to perform great strategic undertakings.

First of all, we would most earnestly urge and recommend a wise moderation, namely, that the cavalry divisions employed in their own front and in rear of the enemy should be supplied with accessories, fully and sufficiently of course, but at the same time only with such as are absolutely essential, and which under no circumstances can impede their enterprises. One instinctively thinks of the 1,600 transport animals accompanying Mischenko's raid!

We consider that besides the material necessary for the transmission of information by telegraph and heliograph, and for the erection and destruction of bridges, railway-lines, etc., a Pioneer company trained to be able to shoot should be attached to each division. This we most decidedly prefer to the much-recommended detachments of cyclists, which to set against their numerous advantages possess the serious drawback, namely, that they are not so mobile as mounted infantry, because they are practically bound to keep to the roads, and when these are in bad condition they may

frequently become a positive hindrance to the cavalry. A mounted Pioneer company, on the other hand, which is able to follow over all kinds of country, would be of great use to a cavalry division by reason of its fire-power as infantry as also on account of its technical skill, and besides it can be employed for other objects. It would, just to give an example, when attached to the horse artillery or machine-gun detachments, set free the cavalry from escorting these, while the sphere of activity of both these arms (artillery and machine-guns), would be considerably increased under the escort of mounted infantry. Such an increase must be welcomed with open arms at the present day, since fire-effect in the reconnaissance duties of cavalry, both in large and small affairs, has acquired a wholly different significance to formerly. There is another point regarding armament. Our cavalry must, in addition to lance and sabre, be equipped with a first-rate long-range carbine, the officers and non-commissioned officers with revolvers, while to each cavalry division, in addition to a detachment of horse artillery, should be attached two machine-gun detachments. These two detachments should, be it noted, be mounted, that is to say, the guns and ammunition are loaded on horses and the men ride, just as is the case in Switzerland and to a certain extent in the Russian Army.

Machine-guns, those too which were attached to cavalry, played a considerable part in the Russo-Japanese War, but it has been shown by the interesting report of Captain Matsuda of the Imperial Japanese Army that, in spite of the time required to set the guns up and take them to pieces again, the mounted detachments were more mobile, and therefore of greater utility than those on foot.

If we complete the organisation, equipment, armament, and training of our cavalry on the lines we have briefly sketched out, then we may say that the war between Russia and Japan has afforded weighty lessons for the cavalry arm, and it remains to be hoped that in the future no task will prove too difficult for them to perform. [*By kind permission of the Editor "Internationale Revue," Dresden.*]

PRECIS OF FOREIGN MILITARY PAPERS

GERMAN PAPERS.

Militär Wochenblatt.

An interesting article appears in the number for the 9th November, reviewing the latest manual on "Combined Training" in the German army. The reviewer states that the guiding principle of the manual may be summed up in the motto—"Forward against the enemy, cost what it may." The importance attached to this principle is shown by the large amount of space devoted in the manual to the description of the various forms of attack, *i.e.*, the adoption of the offensive when two hostile forces encounter each other, the attack on an enemy in position, turning movements, pursuits, attack on woods and villages, etc. The chapter dealing with defence takes up comparatively small space, and one of the first things inculcated in it is the maxim that a good defence embodies the principles of attack.

One of the fixed principles laid down is that any portions of the attacking force suffering a repulse must form up under the nearest cover, and the supports hurrying forward will carry on with them the troops that were beginning to give ground. To cultivate the spirit of the offensive, and to press forward at all hazards is considered the best possible training in peace-time, though it is recognized that in actual war the carrying out of these principles may occasionally lead to reverses. Superior bravery and discipline are regarded as the chief factors of victory, and consequently the most successful form of attack is believed to be that which gives the greatest scope to these qualities in spite of the obvious criticisms to which it may be exposed in peace-time.

The company attack has been abolished, and the battalion is now the smallest unit with which the attack practise is carried out. In order to preserve the iron discipline, which alone enables troops to endure the intense strain imposed by war conditions, the most careful and strict training of the individual soldier, as well as of sections and companies, is inculcated.

While troops are moving to the attack, the formation of the advancing columns is the principal consideration. The instructions on this subject are practically the same as in our own drill book, after the columns have deployed, then follows the development of the firing line at medium distances. With regard to this, it is pointed out that the fire combats of modern times will occupy considerable time during the preliminary stages, and that this must be reckoned with in peace-time. Superiority of fire is the first thing to be established. The attacking lines cannot dispense with supports in rear, but no closed bodies of troops must be exposed to

effective infantry fire. For this reason it is laid down that the artillery combat should precede the infantry attack, but the artillery should also support the attacking infantry up to the last possible moment. Further, it is laid down that individual batteries should be directed to accompany the attack even up to effective infantry ranges. The gradual working up to the enemy, especially in flat country, presents the greatest difficulties. The firing line must be constantly reinforced and the ammunition replenished until the final assault is delivered. Machine guns on the wings, if they can get into position under cover, will be of great use at this point. The chapter on the attack goes on to deal with turning movements, containing attacks, final attacks, etc., but the instructions and precepts given are expressly stated to be intended as a guide only, and are by no means to be regarded as fixed rules applicable under all circumstances.

In dealing with the subject of defence the most noticeable point in the German regulations is that the counter-attack may only be carried out by the general reserve after the final assault of the attacking force has been repulsed, or when the adversary has been driven back from the front of the position.

There is little in the regulation regarding rear-guard actions. The principal point emphasised is that frequent formation of front by small portions of the retiring force only lead to disaster. The main object is to get the infantry clear of the enemy as soon as possible, and to do this deep rather than broad formations are necessary. At the same time it is seldom possible to avoid deploying in order to keep back the attacking troops which will press on with all the strength they have available. In such cases the employment of artillery to keep back the enemy is of particular advantage.

The combined action of cavalry, artillery, and infantry is also dealt with in the new regulations, but the instructions are very similar to those in our own manual on "Combined Training," and call for no special comment.

"Eighteen months with the Russian Armies in Manchuria" is the title of a German work which has just been published, and which forms the subject of an interesting article in another of the November numbers. The author, Major von Tettan, joined the Russian army at the commencement of the war as military attaché and is described as being not only an excellent Russian scholar, but as having also a thorough knowledge of the Russian army and the details of its organisation. His personal acquaintance with that army began long before the war, and he is said to possess a more intimate knowledge of it than perhaps any one outside of Russia. Although his sympathies were entirely with the Russians during the war, he is yet perfectly frank and unsparing in his criticisms of their leadership and methods of conducting the war. In spite of this candour, however, he has lost nothing in the esteem of his Russian friends, and the Russian translator of the first volume of

his book even expresses his thanks to the author for his friendly sentiments towards the Russian army and for his sympathy with their bitter experiences during the late war.

Major von Tettan states in the introduction to his book that his purpose is not to write a history of the war but simply to give his personal experiences and impressions. The latter occupy the greater portion of the book, but to get a clear understanding of the various matters alluded to, it is advisable to read them side by side with a good historical narrative of the sequence of events. The first volume describes the journey to the seat of war, and the unreadiness and want of preparation evident on all sides. Before leaving St. Petersburg the author visited the old invalided General Dragomirow, whose parting words were "Always remember that it is not military science which wins victories, but the spirit and superior 'moral' of the troops." The author remarks that the truth of this saying was soon afterwards strikingly confirmed by events in the Russian army.

Major von Tettan's first impressions at Liaoyang were ominous. He heard there for the first time those ideas which influenced the character of the whole war. The general opinion among the staff at Head-quarters appeared to be that the Japanese should be allowed to land without hindrance, and advance into Manchuria—"The more, the better. We can then beat them here once for all, and quickly finish the war. If we hinder them landing in order to gain minor successes we shall never be able to end the war, and it will be quite impossible to destroy the Japanese." Thus a senior officer on the general staff at army Head-quarters!

Soon after the battle of the Yalu Major von Tettan with a few other foreign attachés joined the staff of Count Keller. He witnessed some small engagements of no particular importance, but his description of the life, thoughts and feelings of the troops at the outset of the war is full of interest. Even at this early stage in the war the inefficiency of the Cossacks and the lack of initiative among the subordinate leaders began to show themselves.

On the 6th July 1904, Major von Tettan is transferred to the staff of the 10th Army Corps, and from that time up to the declaration of peace he witnessed all the battles and operations in which this Corps took part. The 10th Army Corps was originally intended to act on the offensive, but in order to avoid another defeat such as that on the Yalu, they received orders to advance cautiously and very methodically. The way in which this was carried out was to endeavour to reach a position either by day or night not far in advance of the last position, and there dig themselves in. As soon as they had thoroughly fortified one position, they would advance and repeat the same process at the next forward position, and so on. The crippling effect of this 'war of positions' with its advanced, main, intermediate and rear positions showed itself in the first engagement witnessed by the author. At Lagoulin, on the 31st July, 18,000 Japanese with from 40 to 50 guns—chiefly

mountain guns—defeated the 10th Army Corps numbering 24,000 combatants with no less than 97 guns, for the reason that on the Russian side the whole weight of the battle fell on 7 battalions with 16 guns, while the remainder of the force was frittered away among various positions when they would take no active part in the fighting. At Ansin, which served as a preliminary to the battles round Liaoyang, the 10th Army Corps was again defeated, and in the author's opinion the defeat was not due so much to faulty tactics as to the unfortunate propensity of the Commander-in-Chief to interfere with his subordinate, at every opportunity, and the changing of his plans from hour to hour until eventually he decides to withdraw the advance corps to Liaoyang.

It was rumoured at Liaoyang that Kuropatkin had decided to fight a decisive battle there and this greatly raised the spirits of the troops. On the 30th August they were successful in repelling the Japanese attacks, and this still further roused the ardour of the troops and the desire of the subordinate leaders to take the initiative. These hopes were, however, soon dashed by the Commander-in-Chief, who was bent on making use of his carefully prepared positions, and proceeded to fall back on them. This fatal reliance on earth works and prepared positions is exemplified over and over again. The result appears to have been that the army gradually lost the spirit of the offensive, and with every fresh reverse their depression and demoralisation was increased.

The campaign, as witnessed by Major von Tettan, concluding with the battle of Mukden, is clearly and graphically described, and the criticisms of the author on the shortcomings of the Russians and the causes of their reverses are of special interest. The author's work has been universally commended in the German press, and is described as in many respects the best that has hitherto appeared on the war. It should be particularly interesting to British Officers since the principal English accounts of the war have been written by authorities who only saw the operations from the Japanese side. An account by a well qualified military writer giving the other point of view is, therefore, of special value, and the work would evidently well repay translation.

FRENCH IDEAS ON THE ATTACHMENT OF INFANTRY AND CYCLIST DETACHMENTS TO CAVALRY DIVISIONS.

The French Press has of late started an agitation that the French cavalry is not as a whole fit to fight against that of Germany, the latter being more numerous (*viz.*, 102 regiments to 79), heavier, better trained to offensive action, and armed throughout with the lance. It is thought, however, that the French heavy and cuirassier regiments come up to the German standard. Accordingly it is proposed to alter the old organisation of 4 heavy and 4 light cavalry divisions in the following way:—The 6 existing cuirassier brigades are to be split up and distributed equally amongst the 4 heavy divisions, thus constituting 6 mixed divisions up to sample, and

2 light divisions. Each division is also to have machine guns on travelling carriages able to follow over all country.

These improvements do not appear wholly to satisfy opinion in France, and trials are now in course of being made to supplement them by attaching infantry and cyclist detachments to the divisions.

As regards the latter, it is suggested that they can be employed in various ways, such as :—

1. In an advance.
2. As protection to the flanks.
3. In the service of security.
4. In carrying despatches.
5. In the actual combat.

While infantry can be made use of principally in the following ways :—

1. As covering parties.
2. In an offensive advance.
3. In the combat itself.

Examples of the above are then given in practical illustration as carried out in the autumn manœuvres in France in 1906.

AERONAUTICS.

There are two short articles on the dangers to be expected in the future to stationary objects or large formed bodies of troops from explosives, etc., dropped from air-ships and balloons, and it is pointed out what a difficult mark these latter present, besides which it will not be altogether easy to distinguish friendly air-ships from those of the enemy, as the systems of the various nations resemble each other closely.

ALTERATIONS IN THE RUSSIAN CAVALRY.

In 1902 the Russian Lancers and Hussars of the Line were all converted into Dragoons ; now, however, by Ukase of the Czar the old organisation which existed prior to 1882 is being reverted to, and the Russian Cavalry of the Line will in future consist of :—

- 22 Regiments of Dragoons.
- 17 Regiments of Lancers.
- 18 Regiments of Hussars.

Organised as under :—

- (a) 15 Cavalry Divisions each consisting of one Regiment each of Dragoons, Lancers, and Hussars.
- (b) The Caucasian Cavalry Division consisting of three Regiments of Dragoons.
- (c) One Independent Cavalry Brigade consisting of one Dragoon and one Hussar Regiment.
- (d) One Independent Cavalry Brigade consisting of two Hussar Regiments.
- (e) One Independent Cavalry Brigade consisting of two Lancer Regiments.
- (f) Three Independent Regiments of Dragoons.

FIELD KITCHENS.

The portable field kitchen, in the form of a waggon, should, it is suggested in an article, fulfil the following conditions :—

1. Its size should be sufficient to supply a company at war strength, and it should be capable of cooking all kinds of meat and vegetables.
2. It must be able to cook things rapidly, and the food must be kept hot for a long time.
3. It should be possible to carry on cooking while actually on the move, employing wood as fuel.
4. The cooking apparatus should be one which can be used, heated, and cleaned with ease, as well as being durable and simple of construction.
5. An integral part should be a water tank, so that tea and coffee may be easily prepared, and so that the cooking apparatus itself and the canteens of the men can be readily cleaned.
6. The waggon must be easily dirigible and of durable make, and such that it can be drawn by two animals at a trot, and taken over all kinds of country.
7. Seating accommodation is necessary for driver and cook.
8. Room is required for storage of cooking utensils and arms, as well as for an additional meal for the company, and for a day's ration for the riding horses.

JAPANESE LESSONS OF THE WAR AS TO THE EMPLOYMENT OF MACHINE GUNS.

Machine Guns were not issued to the field army until after the Battle of the Sha Ho, and so their work in the field has to be judged from their performances subsequent to this. In the siege of Port Arthur, however, the troops were given machine guns as soon as the place was invested.

THE EFFECT OF MACHINE GUNS.

Moral effect. Within 1,500 metres the moral effect of their fire is greater than that of artillery.

Ballistic effect. Rather greater than that of a company of infantry, and offering a far smaller target than the latter.

Effective range. Generally up to 1,000 metres, but further against parties in close order and artillery in movement.

At the Battle of Telissu dense columns were brought under effective fire at so great a range as 2,300 metres.

Range-finding. Ranges to be ascertained partly from the map; the further ones to be obtained from the artillery.

Night-firing. The great difficulty is the operation of loading, and on a thick night this will have to be accomplished with the aid of a dark lantern behind the shield.

Massing v. Distribution of Guns. As a general rule the effect produced by massed machine guns is not in proportion to the number

of guns in action, as each gun cannot be utilised to its utmost extent: at the same time there are occasions and places such as the space between two groups of defences, when a certain number of massed machine guns can be advantageously employed.

On the other hand the mechanism is so apt to get out of order, that as a general rule two guns should be employed together, in case of one failing at a critical moment.

Mounting. For use with infantry the tripod mounting is the best. This can be taken over any country, while a wheeled carriage offers a large mark, cannot follow over all kinds of ground, and is not really practicable for movements by night.

THE EMPLOYMENT OF MACHINE GUNS IN THE FIELD.

For machine guns, as a general rule, offensive action pays better than defensive: in these ways respectively did the Japanese on the one hand and the Russians on the other make use of them.

A.—IN THE ATTACK.

(a) *The combat of encounter.* Machine guns can be used by the Advanced Guard to hold tactical points seized by the latter, behind which the main body can be allowed room to deploy.

(b) (1) *The attack of a fortified position.* It is a question whether machine guns should be pushed right forward into the firing line (as at Mukden), or be held as an easily moved reserve in the hand of the commander.

(b) (2) *Employment in the various stages of the attack of a fortified position in the field.*

(i) *General Reconnaissance.* Machine guns on travelling carriages accompany the independent cavalry: part of the remainder proceed with the Advanced Guard infantry and artillery: and part should stay at a distance of 8 to 10 kilometres (5 to 6½ miles) from the enemy's position.

(ii) *Preparation for the attack.* In order to prepare the attack machine guns go with the infantry and artillery to within about 1,000 metres of the enemy's position, where they can be employed on the flanks and at weak points.

(iii) *Preparatory engagement.* Machine gun officers under cover of their artillery should take careful note of the ground between themselves and the enemy.

(iv) *The fight.* Machine guns should be advanced with the infantry, and dug in, up to a proximity of 600 to 700 metres: they should not advance closer than this, but fire over the infantry and strengthen tactical points.

(b) (3) *After a successful attack.* Machine guns may be used with great effect on troops in retreat, and should be quickly brought up, and so help to turn a defeat into a rout.

B.—IN DEFENCE.

Tactical posting. Any of the following tasks may be allotted:

1. Distribution amongst the points likely to be attacked by the enemy.
2. The defence of sections which are likely to be held on the pure defensive in order to set free troops, and so be strong enough to assume the offensive elsewhere.
3. The protection of very weak or very important points, where, owing to lack of space, sufficient infantry cannot be employed.
4. To come into action against the enemy when he is obliged to advance on a narrow front.
5. The sweeping of dead angles in front of the lines of defence.
6. The sweeping of the intermediate space between two forts, and flanking the latter.

Overhead cover, and alternative positions. Shrapnel constitutes the most dangerous adversary of machine guns, and whenever possible overhead cover must be provided. And, as machine guns will frequently be the objective of the enemy's artillery, there must be alternative positions prepared to which they should change according as circumstances demand it.

Opening of fire, and choice of objective. It is no use opening fire at widely extended lines some considerable distance off. Ammunition should be husbanded in order, if possible, to be able to bring a destructive fire to bear at closer quarters on thicker lines.

Retreat. Machine guns are not of much use in a retreat, except in cases when a temporary check can be administered to the enemy, such as at a defile, etc.

CONCLUSION.

The results achieved in the Russo-Japanese war will undoubtedly lead to a very considerable increase to the number of machine guns now allotted to all European armies.

The great autumn manœuvres of 1907 in Japan.—These took place in November. More than 50,000 troops were engaged, and the manœuvres were witnessed by a large number of foreign officers who were anxious to see the lessons learnt from the war in Manchuria put into execution. As in other countries the tract of country to be utilised had been previously decided on and announced to the public at large.

The Staffs of the two opposing armies were chosen in a somewhat odd way. The one was composed of only officers of the General Staff; the other of only inspecting officers, and those on the educational establishment.

The following facts were noted about the various arms of the service:—

The infantry were as good as ever in taking the offensive, in discipline, in mobility, and in capacity for endurance. The initiative

of the individual had even increased, and each man seemed to know exactly what was expected of him without continually waiting for specific orders or wanting to copy his neighbour. Each regiment has four machine guns.

The cavalry, however, was in the same sorry state as in the war, except for the fact that the officers seemed to have improved. Apparently great trouble is being taken to raise the efficiency of this arm, but it would seem that much progress is not likely to show itself for some time to come.

The artillery deserves special notice. Since the war an entire re-armament has taken place with Q.F. guns. Not one of these has been constructed by Krupp, but all in Japan at Osaka. These guns are provided with shields large enough to protect four men. Fire is opened at a distance of about 4,000 metres—some 1,500 metres further than with the old pattern gun. Besides the Q. F. guns each division has a battery of heavy field artillery.

The air-ship detachment accomplished nothing of note. The officers of it reported that it was difficult to distinguish the troops in their khaki (erdfarben) uniforms in close country, but in open country observation results were more satisfactory.

The hospitality of the Japanese officers is particularly praised.

Remounts in the German Army.—It is interesting to note that as many as 13,445 remounts were purchased for the German army in 1907 out of 27,121 animals which were presented, *i.e.*, roughly 50 per cent.

Notices of books.—There is a long notice of the 3rd part of "Tactical Studies of the Russo-Japanese war of 1904-05" by the German General Staff, and also of a paper published in No. 355 of the Journal of the R. U. S. Institution entitled "The Native Races of South Africa considered from a military standpoint" by Colonel Jeffreys.

FRENCH PAPERS.

*Précis from Revue Suisse Militaire—September 1907 to
January 1908.*

The September number has a very opportune article on "Patriotism and the History of Wars."

The author, basing his argument on national wars, as opposed to the wars of great captains, shows that the secret of success lies in universal preparation during peace time. The early Swiss times, the French Revolution, the Franco-German war and lastly the Russo-Japanese war furnish examples.

The early days of the French Revolution provide a striking instance. Universal brotherhood was the order of the day; war was unthinkable. The Assembly placed a clause in the Constitution that France would never undertake a war of conquest. The immediate result was disaster in the first campaign to which France was committed. "Equality" and "brotherly love" meant indiscipline and unpreparedness.

This phase was, however, soon followed by another. France was now to regenerate the world. Enthusiasm displaced apathy. The martial spirit was abroad. The marvellous succession of victories to the French arms in the beginning of the last century are a sufficient proof of the effect of the change. On the other hand the Prussians in 1806 furnished a remarkable contrast. Like France a few years before, Prussia was a centre of theories of Cosmopolitanism, universal love, etc. The army was looked upon as little better than a band of brigands. Small wonder then that this army, which had been the creation of Frederick the Great, but was now discredited and condemned as an inferior sort of trade, gave way before the exalted enthusiasm of the French at Jena and Auerstadt.

But in 1870 the scene was changed indeed. Prussia had been at school. For a quarter of a century or thereabouts the nation had been preparing itself for war. Not only was the military training most carefully controlled and perfected, but also every possible influence was pressed into the service of educating the country up to the required standard. Poets, historians, political leaders, all lent a hand. Naturally when the hour came the Prussian nation in arms was irresistible. And what was France doing? The old impracticable ideas once more held sway. "Militarism is a plague," said one leading man. "Thank Heaven," another declared, "the national guard will not often have to offer its breast to the enemy's bullets." A feeble scheme of universal service was set on foot, but no attempt to prepare for war seriously was made. Inaction and disorganisation were the dominant notes throughout. Sedan and Paris point the moral.

Lastly, the author draws attention to the marked difference between the active, living force of the Japanese patriotism as opposed to the inert, fatalistic courage of the Russians. Port Arthur and Liaoyang are recent enough for the lesson still to be borne in mind.

In fact it comes to this, that the forces which appear on the field of battle are the same that have been cultivated in peace. The nation, which fosters its patriotism, which teaches its children to be prepared for any sacrifice for the community, will create strong armies and give birth to brave captains. While the people, which allows its sons to become effeminate, which thinks peace superior to war and nourishes its youth on philosophic theories, in place of preparing for the realities of life, will inevitably find itself worsted in a struggle.

Another interesting and topical article in the October number is "*Recent Progress in Aeronautics.*"

Dirigible balloons and flying machines are the question of the day. It is reasonable to hope that the numerous experiments now in progress on all sides will lead to some practical solution of the problem. But up to date it has not been clear to what use the air vessel can be put, except in the case of dirigible balloons. These will apparently be pressed into the service of science and sport, but commerce will not derive much advantage from their introduction. War, on the other hand, cannot but be nearly affected.

Here again, however, there is considerable danger of an exaggerated idea of the capabilities of the balloon being formed. The factors of weight, storage, space, etc., all militate against the alluring conception of a flying battery, itself invulnerable, dropping enormous bombs on troops and forts alike. But for reconnaissance work, communications, and the like, the value of a steerable balloon is now indisputable. But without going into speculation on these points, this article proposes to show generally the powers and principles of flying machines as they stand to-day.

Steering of Balloons.

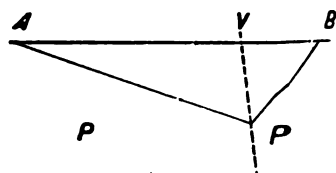
A balloon drifts with the wind. To control its movements it must therefore be driven by a power sufficient to overcome the strongest wind currents. But at the same time the source of power must not absorb too much of the ascensional force, *i.e.*, it must not be too heavy.

The explosive motor provides such a source of power, light, but immensely effective—3 *kg.* per horse-power and even less has been attained. But the explosive motor introduces the element of danger due to the proximity of fire to inflammable gases. Moreover, the consumption of fuel alters the weight to be carried, the engine in motion is apt to set up oscillations in the suspended framework, and so on. But still these motors combine the elements of power and lightness in a way, which cannot be otherwise attained, and so they have been generally adopted for airships. The only means of propulsion is the screw.

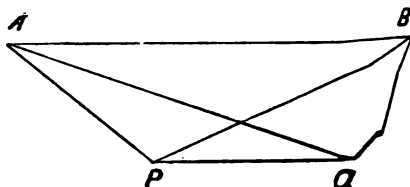
The next point is that inasmuch as the airship is exposed to shocks of all kinds, and strains and stresses of varying natures and intensities, it is of the utmost importance that the balloon and its suspended car should form a rigid body, to the extent possible.

This is attained by the employment of the principle of the triangle of suspension.

Let AB represent the balloon, and to it connect a point P of the net by cords PA, PB. Then, although PA, PB are flexible cords and not rigid rods, the triangle APB will not be deformed, so long as the vertical PV remains within the angle APB, however much the line AB, may be inclined to the horizontal.



Now suppose AB to be the balloon, and PQ the net. Then if PQ is to be rigidly suspended from AB all that is necessary is to attach P and Q to A and B by two cords AP, AQ and BP, BQ. This gives two rigid triangles APB, AQB.



This is the invariable system of attachment of the car to the balloon. The demonstration of this principle is one of the claims to fame of the engineer Dupuy de Lôme, and its neglect a contributory cause to the failures of some of M. Santos Dumont's ventures.

The next point is instability in motion. The resistance of the air is met by the envelope of the balloon at points relatively far removed from the direction of action of the propeller. This causes oscillation. Then if one end of the balloon rises above the horizontal, the gas flows to that end with fatal consequences. To meet this difficulty the system of planes, or horizontal wings is employed. The latest French balloon is the "Patrie," said to be an improved "Le Baudy." The main points of this dirigible are now described.

The shape is elongated, pointed to the front, but the rear end is of a shallow ellipsoidal form. The idea of the sharpened prow is that of cutting a path in the air, after the analogy of the bow of a ship. Certain scientists have arrived theoretically at the conclusion that the ideal airship ought to have its largest diameter in front, and a pointed stern. Birds have the widest part of the body well forward. Also something is required to prevent retardation by the vacuum formed behind the balloon. However, in practice the sharp front has been found most suitable. The rounded stern also forms a foundation for some sort of tail. The balloon is in fact a volume of revolution, having as axis the line joining its two ends. It assumes a curved form in the air, but that is merely due to the weight of the car in the centre, which pulls that part down.

The gas used is hydrogen. The envelope is a species of rubber woven tissue, which is firm, water and air-proof, supple, light, economical and readily joined at the seams. As light rays have some action on this material, it is painted with bichromate of lead, giving a yellow colour.

One of the great difficulties with balloons is the fact that the gas in the envelope expands or contracts in proportion as the density of the surrounding air decreases or increases. To cope with the expansion is easy, the gas can be allowed to escape. But contraction is a different matter. The only way is to introduce air. If this is done direct, the result is the formation of an explosive mixture of air and hydrogen. A receptacle is therefore provided for the air, in the shape of a small balloon inside the main balloon. This is inflated as required, and maintains equilibrium.

To minimise the oscillatory movements so dangerous to the balloon's stability, a number of horizontal and vertical planes are employed. The chief of these is a large horizontal elliptical platform under the balloon. To this are attached the envelope above, and the car, etc., below. It is as if were the backbone of the airship, a horizontal and a vertical rudder, fixed and movable planes, a keel, and a sort of fish-tail combined to render the balloon remarkably stable.

A pair of two-winged screws are used, driven by a Panhard and Levassor 70 horse-power motor at 1,000 revolutions. The screws are of a special thin steel.

The car is suspended on the indeformable triangle system. It is like a flat-bottomed vertical-sided boat. The framework is of steel tubing. Six passengers are carried. Underneath the car is a sort of inverted pyramid of steel tubes. This *bequille* is one of the main peculiarities of the Julliot airships. It acts as a rest for the balloon when it comes down, and besides preventing the screws coming in contact with the earth, it forms a point on which the whole airship may be readily turned.

The article "On the Progress of Aeronautics" is continued in the November number.

The details of the "Patrie" are as follows:—

Length 60 m.; maximum diameter 10.30 m.; has sufficient margin of lifting power to carry in the car 4 passengers; 100 kg. of liquid fuel and about 800 kg. ballast; radius of action 100 km.; maximum speed 46 km. per hour.

The balloon has been out in all weathers and at all seasons, but it is admitted that atmospheric conditions exercise considerable influence on its practical power.

The question of the gas supply is one of extreme difficulty. The three methods in vogue are (a) to return to the starting point; (b) to proceed to a regular balloon station; (c) to send out either small filled balloons or tubes containing compressed hydrogen to a given point. The disadvantages attendant on each one of these plans are obvious, involving as they do the necessity for remaining within reach of a fixed point or points.

In Germany the rigid envelope has been the fashion. Count Zippelin is the chief exponent at present of this idea. But the *Motor-Luftschiffart-Studien-Gesellschaft* has conducted experiments on the ordinary system, with the result of adopting Major von Parseval's dirigible. This type is an elongated cylindrical envelope with the forward end pointed. Length 25 m.; maximum diameter 8.90 m.; capacity 2,800 cubic meters.

The shape of this balloon is maintained by two small interior balloons, one forward and one aft. These are connected and serve to elevate or lower the axis of the balloon. The car carries three persons, and is suspended on an original system.

There is a Mercedes's motor which drives a screw on a horizontal shaft. The blades of the screw are of cloth and closed at rest, but fly open under the centrifugal action when the machinery is in motion. There are two horizontal and one vertical planes for stability. The last carries a rudder.

Another German balloon is that of Major Gross. The chief characteristic of this airship is its extreme portability when deflated. One vehicle carries envelope, engine, etc. Length 40 m.; cubic capacity 1,800 m. The balloon is a cylinder with spherical ends. Diameter 12 m. Naturally the speed is not great, 20 km. per hour being about the limit. There are two horizontal planes, and one vertical keel with rudder.

In England the success of the *Nulli Secundus* is a sufficient proof that this department of warfare is not being neglected. The balloon is sausage-shaped, length 30 m., diameter rather under 6 m. The car carries three. To the rear of the car is a large sail on a wooden framework, which acts as a rudder. There are two fins, about the centre of the car, for stability.

Aviation.

Aviation is in reality nothing but an imitation, more or less distant, of the flight of birds. The followers of this branch of aerial navigation discard the balloon altogether, and depend on the utilisation of the air resistance to remain suspended in that medium. There is indeed a very general theory that the future lies with the heavier-than-air party. The cumbrous balloon with its numerous drawbacks cannot, it is said, survive the day that sees a heavier-than-air machine working with perfect security. There are three descriptions of these flying machines.

The *orthopters* profess to imitate birds directly. They are supported and propelled by flapping wings, which perform all the functions of the appendages from which they take their name. But up to date this system gives no hopes of satisfactory results.

On the other hand the *helicopters* seem to promise well. In these the action of screws working on vertical axes give the supporting power. For horizontal motion a second series of screws or other power is necessary. However, for the present the third description of flying machine is chiefly to the fore, the *aeroplane*. Captain A.

Sazerac de Forge's book *La Conquête de l'Air* gives an excellent definition. ".....the aeroplane rises into space under the propulsion of the vertical component of the wind's force, or by the resistance of the air acting on an oblique surface." The principle is analogous to that in virtue of which the kite rises at the extremity of its retaining cord. Only here the kite's cord is replaced by the motion imparted to an oblique screw by a motor. The aeroplane more or less meets the air.

These machines consist essentially of a system of surfaces, usually plane, disposed in one or more parallel layers.

In order to produce air-action on these surfaces and consequently to raise the machine, this latter must meet the air with a certain speed. It must be started, and when once started it can, theoretically, maintain itself in the air.

To give the start the machine may be tried by, say, an automobile, or it may be launched from an elevation. Neither method is very practical. Once in the air the force imparted by the motor should in theory be the only difficulty. But in practice problems of stability and steering have proved at least equally important.

Lastly, landing is an operation of much delicacy, and two frequently fraught with disaster. Still with M. Santos Dumont, Captain Ferber, the Wright brothers and many others busily engaged on the solution of the problem, it seems permissible to work for practical results within a reasonable period.

Captain Sazerac de Forge considers that in theory the helicopter with its great advantage of being able to regulate its horizontal speed at will or even halt in mid air, should play an important part in the final struggle for aerial supremacy. But the aeroplane has one point in its favour, in that it is the only airship that utilises the resistance of the air for its vertical equilibrium. It has nothing to do but to ensure its forward motion. It is, however, possible that a combination of the aeroplane and the helicopter may eventually give us the perfect flying machine.

In this number the German correspondent has some interesting notes on the *Imperial Manœuvres of September 1907*.

A trial was made of wheeled kitchens. A large boiler mounted on four wheels carried the food for a campaign. The boiler is surrounded by oil. The oil is heated by a fire underneath, cooks the food and keeps it warm. A smaller boiler is used for coffee. It was proved that meat could be cooked on the march so as to be ready to serve on halting. Even newly killed meat was successfully treated. The experiments will, it is considered, lead to the general introduction of these wheeled kitchens. Every precaution was taken to make the manœuvres as like the real thing as possible. Neither party knew where the other started from; the "task" of each party was only received the evening before the opening day; and each corps received the unexpected news that it was provided with a division in support, on the same evening. Thus all arrangements had to be made on the spot, and without previous consideration.

Forty-two automobiles were furnished by the volunteer automobile corps. These were distributed among the staffs with most encouraging results. Their advantages in war were amply proved.

On the other hand the dirigible balloon was not used. This weapon has not yet reached the stage of practical politics.

The endurance of the troops was severely tested. Some units marched as much as 65 *kilometres* into action. Night marches were frequent; but there was little wastage.

The new regulations were carried into practice. There were no dense lines of scouts, or firing lines, though dispersion was not carried to the extreme that has recently obtained in France. Cavalry were fully alive to the importance of their duties as eyes of the army, though in the writer's opinion some rashness was displayed in pursuits. Here again, however, the independence granted to cavalry by the provision of machine guns goes a long way to make up for any small lack of caution.

The field artillery was happy in hitting off the medium between taking up a position overhastily, and in too exposed a situation, and opening fire in too precipitate a manner on the one hand, and in over caution and care in taking up positions on the other. The "*Gedeckt oder offen*" controversy raised by the late war has not been settled, but it seems preferable for artillery not to be bound down by hard-and-fast rules, and to be able to take up open or covered positions as circumstances demand.

It may be remarked that the great night attack failed, and the Emperor took the opportunity to discourage this form of offensive tactics.

December.—This is a good number. A very readable article gives "*Some Observations on the Manœuvres of the (Swiss) 1st Corps in 1907.*"

The article is sub-divided under several headings, which may be noticed shortly.

Outposts.—Of the double duty entrusted to them, the *protection* was usually well carried out, but the same was not true of the *observation*. On one occasion the retiring enemy was able to execute a complete withdrawal during the night, but the friendly outposts failed to observe the movement.

Infantry fire control.—There was considerable progress. Firing lines were well extended and perfectly under control. Cover was made good use of, so that the artillery reported a paucity of visible targets.

Topographical reports.—There was a general failure, except in the artillery and engineers, to furnish sufficient topographic detail with tactical reports. Such details as means of approach and communication, artillery positions, nature of the ground, rivers, etc., should always be given. A typical report is given.

Battle reports.—These left much to be desired. These reports, made as they are by even the smallest units, are intended to form the basis of the history of a campaign. It is therefore most necessary

that the greatest accuracy should be observed. Among other things an officer charged with making a battle report should—

- (1) note exact time of receipt of all orders and supports;
- (2) take brief notes of orders, etc., which are important, and may become lost;
- (3) note the exact time and situation when any important move or event takes place, *e.g.*, deployment of the advance guard, commencement of the pursuit, etc. A rapid sketch on the map is of great assistance, and for this purpose staff officers should have a new map every day.
- (4) All ranks should be encouraged to take notes of the events in which they take part. These are usually very interesting reading after a campaign.

It is desirable that in the case of headquarter staffs one officer should be detailed specially for this duty.

Orders for concentration of movement.—It is always a question in a given situation whether the orders for the next day should require a concentration or a movement. The rule is that when the information is not sufficient to form the basis of a plan of movement or of an attack, a concentration should be made, and the final orders issued at the rendezvous.

This was borne out by these manœuvres. On the 4th September evening the 1st Division was given no information but the following:—Enemy's cavalry and *landsturm* occupy the passages of the Jorat and the line of the Broye. Our patrols not able to cross.

The enemy had therefore several lines of conduct open—to retire, to hold the right bank of the Broye, to advance at night and attack, etc.

The 1st Division, had it received orders to march, would have run the risk of being dealt with in detail. Therefore the order actually given, to concentrate the next morning, was sound.

Other examples are quoted, all proving the correctness of the principle.

Cyclists.—Considerable use was made of these for carrying orders, keeping up communications, etc. The motor cycles were especially valuable. An experiment of employing an officer as orderly officer with a bicycle was tried with success on several occasions.

Automobiles.—The Volunteer Automobile Corps was made use of for the first time with most encouraging results. This corps provided the *chauffeurs*. The advantages of the motor car for transmission of orders, for inspecting purposes, reconnaissance, and for the rapid movements of staff officers is already well known, but the trained drivers were of great assistance. One incident may be noticed. One evening a company on halting found its soup had been taken by mistake to a place 4 kilometres away. One of the subalterns with praiseworthy presence of mind jumped into a car, ran across and brought the tins of soup, still hot, to the men.

Supply.—It was found that the new fresh meat carts did not in practice prove so successful as in theory. The cart which follows

PRECIS OF FOREIGN MILITARY PAPERS.

immediately in rear of its unit in the battle train is (a) too exposed to the heat, and the meat is very apt to go bad; (b) too exposed to the enemy's fire; and (c) these vehicles add to the length of the *train du combat* without any corresponding advantage in action.

It was found that by employing motor cars the fresh meat could remain with the provision column, and yet be brought up to the troops in plenty of time when needed. If the column is 16 kilometres in rear the motors can easily bring up the meat in an hour.

The number for January 1908 continues the "Observations."

Employment of the civil services of telegraphs and telephones.—Considerable use was made of these services, orders being issued that military communications should be given priority. The result was on the whole very successful, specially for linking up the staffs at different points when halted. Members of the two civil services were attached to the headquarters staffs and assisted materially in the work. For instance, on one occasion the head quarters of the 1st Division having halted at a place where no telegraph office existed, the telegraph official obtained some cable and installed a station in a very short time. Similarly telephone stations were installed when required.

Motor wagons.—Four 16 horse-power wagons were employed in the 1st Division to bring up fresh meat for 12 battalions. The load was from 2,000 to 4,500 kg., and the speed 16 to 17 km. an hour.

The experiment was a complete success. As soon as the evening halting-place was known, the wagons started independently from the provision column and brought up both meat and kitchens to the troops in good time.

Projectors to mark artillery fire.—These devices were borrowed from the systems of neighbouring armies, and consisted of reflectors, using either sun light or a powerful lamp. The object was to show the exact unit on which artillery fire was directed. The results were rather inconclusive.

Corps park.—It is admitted that parks cannot be used on manœuvres (and there were none represented), but it is suggested that the officers might attend, and take notes on ammunition supply, marches, length of columns, halts, etc.

The park and the service of communications (*Etapes*) were alone unrepresented. It is suggested that it would be of great advantage at least to organise one "terminal station." At this might be concentrated the field bakery, the supply stores, the veterinary hospital, the infantry dépôt, the remounts, etc. This would permit of these services adding a little *practice* to their excellent *theory*.

An interesting examination of the "*Initiative of Commanders of Units*" forms another article in the December number.

Initiative is the subject of much study in these days, both from the examples of former wars, and in manœuvres. These latter afford the means of learning to exercise initiative, and of acquiring an eye

or a situation (*coup d'oeil*). This *coup d'oeil* may be defined as combining all the following requisites—

- (1) A rapid and certain appreciation of the situation of the army, of which one's unit forms a part.
- (2) An appreciation of the situation of one's own unit in the whole.
- (3) A power of discerning without hesitation the operation or manœuvre indicated by this double situation.

For commanders of armies are no longer in a position to direct their troops in person on the field of battle. The extended fronts, etc., prevent that. Consequently an order from superior authority traversing a long distance may be out of date and inapplicable when received; the order may arrive in time, but the situation may have altered; the order may not be clear; the reports on which the order is based may have been late; lastly the order may not arrive at all.

For every case it rests with the subordinate commander to act, sometimes even in opposition to the orders he receives. To be able to do so, he must be sure of himself, and of his chiefs. Practice and experience, fortified by study, alone can give this power.

Here the study must be confined to history. In 1870 it was observed that the German subordinate commanders gained victories by marching towards the sound of the guns, whereas the French who remained stationary were invariably beaten. But the inference that the German method is the better is not of invariable application, as witness the example which follows:—

On the 2nd September 1904, the 1st Japanese army threatened the Russian left wing. The Russian XVII Corps, under Bilderling, was to cover this flank. The extreme left was given to a brigade of Orlov's Division, towards the Yentai heights.

Orlov's contention is that the orders received were not clear. "If Bilderling is.....attacked, march to his support. If he is attacked support him....."

In the morning of the 2nd before he had ascertained what exactly these orders meant, Orlov heard from a Division of the XVII Corps that there had been a fight during the night, on a hill in front of his position. Hearing firing going on, he imagined this Division still engaged. He therefore advanced to assist.

But meanwhile the Japanese extreme right continued its offensive, and succeeded in taking possession of the Yentai heights, which Orlov had just left, thus uncovering the flank of the army, which it was his duty to protect. The brigade taken in flank and rear fell into complete disorder. Moreover, it is said that had Orlov merely held on till mid-day, he would have enabled Kuropatkin to make the counter-attack, which he had in contemplation. Thus apparently (though all authorities are not agreed on the point) Orlov was not right in marching towards the guns.

A curiously precise example on the other side is given. On the 6th August 1870, the 2nd French Army Corps under Frossard

was receiving the German 1st and 2nd armies' attacks on the Spicheren heights. At Puttrelange, 17 *km.* away, was Castagny's Division, which had been placed at Frossard's disposal.

During the morning Castagny heard guns in the direction of Forbach. He started at once. At 1-30 P.M., however, when he had covered a third of the distance, the firing ceased. He returned to Puttrelange. But between 5 and 6 in the evening the cannonade recommenced. He started again. The Division marched for three hours, and as night fell reached a point within 6 *km.* of Forbach. There an officer of Frossard's staff met them, with the news that all was lost. Therefore, the action of marching towards the sound of the guns was quite correct, had it only been persisted in. Several other examples are given.

ITALIAN PAPERS.

[*Rivista d'Artiglieria e Genio*, September to December 1907.]
September 1907.

The Reorganisation of the Japanese Army.

Large units.—Two new infantry divisions are to be formed bringing the total up to 19. Army corps are not organised during peace, but made up on mobilisation from a varying number of divisions.

Cavalry.—The squadrons of a regiment to be increased from three to four, and a new independent brigade of two regiments of four squadrons to be formed.

Artillery.—Adoption of a new field gun. Formation of horse and heavy artillery units. During the war, Krupps had been given an order for 400 guns of the 75 mm. type supplied to the Swiss Government. But these were not delivered till after the war was over. The Japanese then took up the question of a gun on the English model. But whether for reasons of weight in draught, or because Krupps had an exclusive contract, it is said that this firm has received further orders for guns. But from other sources it appears that the orders are for steel ingots to be bored out and finished in the Osaka arsenal. The *France Militaire* has it that the new Japanese gun uses a shrapnel with fuze to 7,500 metres.

There have been hitherto no horse batteries. Two have now been raised and equipped with the new gun. There will eventually be six.

It is understood that in addition a maximum of two brigades (probably 48 guns) of heavy artillery will be formed, and armed with 15 cm. and 12 cm. Q.-F. howitzers from Creusots. Also experiments are in progress at Osaka for a 10.5 cm. howitzer to replace the 12 cm.

Only three divisions are now provided with mountain artillery, and it appears likely that these will be withdrawn and replaced by field artillery. The mountain batteries will then be formed into independent brigades, to be employed as desired on mobilisation.

Engineers—The only addition is to convert the four railway companies into four battalions, one for each army corps. This is in recognition of the enormous importance of the railway communications in Manchuria.

Balloonists.—This is only in the experimental stage. But when the equipment is tried and found to be successful the present small cadre will be increased as necessity demands.

Bridging equipment.—This is being improved and increased. Full equipment for a 300 m. bridge will be given to each army corps.

New fire-arms.—Experiments with an automatic rifle having failed to produce any conclusive result, the Arisaka rifle, which is an improvement on the existing pattern, is being issued, and the active army will be re-armed this year.

Machine guns.—It appears likely that the Rexer automatic gun will be adopted, two or three per company of infantry being the proportion.

Two-year service.—The two-year system for infantry seems likely to be brought in at no distant date. The other arms will continue under the three-year arrangement. The effect will be to increase the annual numbers who are trained by one-fifth.

At the last census (1903) the population of Japan (excluding Formosa) was 46,732,138 of whom 23,600,931 were males. The number of the latter who will reach their 20th year in 1907 will be over 320,000 of whom from 110,000 to 120,000 will be called upon to serve. The minimum height has been increased from 1.485 to 1.51 m.

November 1907.

The November number is of unusual interest. It begins with the presentation of its ensign (*bandiera de combattimento*) to the new destroyer *Artigliere* at Naples in November 1907.

The ensign was presented to the ship by the officers of the artillery as a token of the close connection between the services. The Inspector-General of Artillery Lieutenant-General Mangiagalli performed the ceremony. The Duke of Aosta, himself an artillery man, was present, and Vice-Admiral Annoaizzi represented the Ministry of Marine. There were a large number of spectators.

The article traces the development of Italian naval power, beginning with the agitation raised by the Ministry of Marine some thirty years ago, which culminated in the launching of the battleship *Duilio*, which may be termed the foundation of the Italian navy. Almost at the same time public attention in Italy was drawn to the necessity for an intimate connection between the forces on sea and land. This latter idea was rapidly developed, and became the subject of serious study. A glance is given at the system of combined manœuvres, with an especial reference to the great attack by sea on the fortress of Spizia in 1888. The article continues by tracing the growth of the principle of combination, and notices particularly the application thereof by the Japanese in the late war.

The latest development in Italy was the happy inspiration of the Ministry of Marine to name four new destroyers after the arms of the land service. The artillery were enthusiastic over the idea, and eventually decided to present its colours to the vessel which was to bear their name. The article closes with a reference to the gallant frigate *Cerere* which just a hundred years before brought relief to Naples through the whole English fleet.

Some details of the vessels are also given. The *Artigliere* is of the Thornycroft type, displacement 370 tons, speed $28\frac{1}{2}$ knots, 6,000 indicated (maximum) horse-power, 3 torpedo tubes, etc.

The same number has a long article on the Engineers, Balloonists and Telegraphists in the Russo-Japanese war.

The introduction notices that all authorities are agreed in their praise of the technical troops on both sides. A detail of the various services follows, of which the following is a summary:—

<i>Russia.</i>			<i>Japan.</i>	
55 companies	sappers	...	...
8	"	pioneers	71 companies	pioneers.
22 $\frac{1}{2}$	"	telegraphists	22 sections	telegraphists.
6	"	balloonists	...	
50	"	railways	5 companies or sections	railways.
				9 sections engineer field park.

Apparently all the Sappers also understood Miners' work.

Next comes a brief examination of the various services, and their work in the war.

TELEGRAPHIC SERVICES.

(a) *Electric Telegraph and Telephone.*

Russia.—The personnel employed was generally uneducated, and illiterate, and failed to respond to the situation.

On the field of battle only the large units were connected by telephone or telegraph. Orders, et., between small units were generally transmitted by signal or megaphone. In the course of the war, however, it was found that the best means of transmission is always the telephone. As none of the troops had been provided with the necessary apparatus it had to be obtained during the campaign. Wires were usually laid on the ground.

Japan—The Japanese, on the other hand, made every possible use of the telephone from the first. The telegraphists attached to each Division during the march connected the staff of the Division with that of the Army Corps by telephone, and if time permitted by telegraph as well; also the staff of the Division was connected with its Brigade and Artillery Commanders. The latter again were connected with the principal observing stations.

At the same time the Army Corps staff were telegraphically connected with each other and the Headquarter staff.

The difficulty of laying out lines of telegraph was very great on account of the cold, especially during the battle of Mukden. The rate was as slow as one *kilometre* per hour.

Bare wires were generally used. Of the examples given of the work done, one may be quoted. Between the landing in Corea and the 20th March 1905 the field telegraphic section of the Guard Division laid 960 *km.* of line, and took up 200 *km.*

(b) Wireless Telegraphy.

Russia.—The companies were divided into two sections, each with three Marconi stations. Two wheeled carts were used, a station requiring 14. The antennæ used were wires stretched on bamboo frame-work.

One company arrived at the theatre of war in the middle of June, and was employed to connect the headquarters of the 2nd Army with Mischenko's Cavalry Brigade on the extreme right.

In spite of the short distance, however, the communication failed entirely, so that the common name for the system was not *wireless* but *useless*. The reasons seem to have been want of knowledge by the personnel, atmospheric disturbances, and the fact that the equipment was too heavy to follow the cavalry.

However, by the end of July, practice had had its effect, and when Mischenko in the course of a reconnaissance was obliged to have recourse to Marconigrams (the ordinary telegraph service being interrupted), he did so with complete success. The written message system was used up to 70 km., and the sound receiver at much greater distances. Faith in this form of telegraphy was completely restored.

The *Japanese* had no wireless installations in the field.

(c) Optical Telegraphy.

Russia.—Flag signalling was only brought into use in the autumn of 1904, when its advantages had been demonstrated by the *Japanese*. Black flags were used. For night work acetylene lamps were employed.

Heliographs were used by the telegraphists to assist the telephones and telegraphs. On the Shaho the helio was used at 7,500 m., a respectable distance.

Japan.—The *Japanese* at first made considerable use of Chinese as signallers. These men signalled the "overs" and "shorts" for the artillery at Haicheng, but after some had been captured by the Russians, less use was made of them.

All the troops, however, employed the flag. At night fire balloons carrying coloured lights were frequently tried with success; also kites with lanterns. Coloured lights and lanterns were often used. Helios were not employed.

The Russians made an attempt to improve the speed of laying connections by using mounted telegraphists but without any marked success.

Consideration.

Although the war of 1877-78 had shown the Russian authorities the tactical advantages of the telegraph, they entered upon this campaign with a totally inadequate equipment, and an insufficiently instructed personnel. They endeavoured, however, to make up for this during the campaign, and mainly through the efforts of the troops themselves, attained to some degree of success.

Optical signalling, especially on the Japanese side, proved of distinct advantage. But it was clearly shown that nothing can replace the telephone effectively during the combat.

The Japanese had taken every precaution in organising their various systems for the transmission of orders, etc., but did not use the wireless telegraph. The Russians, on the other hand, did excellent work with this means of communication.

It appears that the helio is likely to have a more extended field in the future.

Balloons.

The Russians employed balloonists in the field for the first time. The first ascent was made at Kuadsiatsi, south-west of Liao-yang. The gas was manufactured on the spot, with iron and sulphuric acid. The balloon was about 5 km. from the enemy, and was able to observe the Japanese shelters, guns, earthworks and even single men.

During another ascent near Liao-yang the Japanese found the range of the balloon, but failed to do it any damage.

On several occasions the balloon was of the greatest help; observations were made of the Japanese trenches, photographs were taken, and the Russian artillery fire was controlled from the car.

Once the envelope was struck by three shrapnel bullets, but practically no harm was done. The balloon had been allowed to descend when still too close to the enemy, otherwise it would not have been hit.

The balloon required a very heavy windlass to control the mooring cable. This made movement difficult, as the windlass had to be transported over the execrable Manchurian roads.

The material of the envelope failed at temperatures below 10° C.

The balloon had to be inflated immediately before the ascent, and therefore all apparatus had to be carried about. The gas was made on the spot.

Generally speaking the balloons rendered most important services, but the Russians did not make the best of them. The reason was that the balloon was seldom permitted to go near enough to the enemy.

The Japanese did not employ balloons in the field.

The general conclusion is that neither side in this war obtained all the advantage possible from the telegraph services and balloonists, and that it is clear that improvised organisations will never give anything but inferior results.

The same number contains a lengthy and detailed essay on "*The Characteristics of a Modern Coast Gun*"

The argument is divided under three heads—the gun, the obturation, and the ammunition.

Under the first head comes a long and technical discussion touching on the length of the bore and its relation to high muzzle velocities and high pressures; the merits of the shrunk on cylinder and wire-wound systems of construction, etc.

The second part compares the wedge and screw systems, giving Krupp's arguments for his firm reliance on the former, and the numerous reasons that can always be adduced in favour of the latter.

The third part is a very able examination of the ammunition question. Length and weight of cartridge, material of cartridge-bag, propellant, are all treated at length. Then the two main types of projectile, shell and armour-piercing are given a place, and driving bands, caps, shape of head, etc., are some of the points noticed.

The chief articles in the December number are one on "Modern Steam Generators" and the continuation of the "Modern Coast Gun."

The former is very technical, going into details, and making use of many formulæ. The chief headings touched on are "Phenomena in Steam Boilers," "Various Theories on the Circulation in Multitubular Generators," "Some Experiments," "Method of Calculating the Intensity of the Circulation," and "Certain Types of Multitubular Generators."

The article on "Modern Guns" commences with an examination of the effect of naval fire on coast batteries. This it considers to be far from despicable, and therefore contends that the batteries require some substantial means of protection, such as armour, shields of any kind, or disappearing mountings.

The question of protection is then discussed, the disadvantages of the apparently perfect disappearing system explained, and the opinion expressed that some form of shielded cover is essential, with a preference (for heavy ordnance) of the armoured turret.

The next point is the service of the gun. Various mechanical means of loading, laying, etc., are examined and the verdict passed in favour of electricity, as the most convenient, and as affording power for other purposes in the battery, *e.g.*, lighting, search-lights, ventilation, ammunition supply, etc.

The methods of laying are then passed in review, the telescopic sight being preferred. The range-finder follows next, a vertical base pattern being advocated.

It is remarked that the battery commander's station should be as well protected as the gun emplacements.

Then the question of grouping guns is considered. Groups of two or four appear to be preferred.

Lastly a summary gives the general characteristics of the typical modern coast gun:—

12-in. gun of 67 tons; length 50 calibres; projectile weighing 445 *kg.*; muzzle velocity 890 *m.* secs.; Welin screw; a nitro-cellulose charge consisting of four 45 *kg.* cartridges; an armour piercing capped projectile, and a high explosive shell; gun mounted in a species of armoured turret (cradle mounting); electric power; one round to be fired in 50 secs.; telescopic sight; 4 guns in a group.

The same number gives some notes on changes in the organisation of the French army.

Engineers.—The experience of the Russo-Japanese war has proved the necessity for telegraphic and telephonic communications in the field, even during the progress of an action. A general increase of effectives is therefore required, together with an augmentation or creation of certain specialists, such as balloonists and pontoonists. To do this without appreciably affecting the budget it has been decided to reduce the staff of this arm, to do away with bands, to reduce the strength of French men in the Algerian-Tunisian units (replacing them by natives), and to cut down the strength of the railway sapper companies. Certain economies are also proposed in the administration (or supply) officers. There is an idea of employing civilians.

The future organisation will be as follows:—

- 6 regiments of sappers and miners (72 companies).
- 1 four-company battalion of sapper balloonists with a detachment of pigeon fliers.
- 1 battalion (6 companies) of pontoonists.
- 1 regiment of railway engineers (3 battalions of 4 companies).
- 1 regiment (2 battalions of 4 companies) of telegraphists.
- 1 independent battalion of engineers in Algeria-Tunisia (6 companies of sappers and miners, 1 railway company, detachments of telegraphists and drivers).

Practically every regiment has a company of drivers attached.

The organisation of an engineer regiment is given in detail. Briefly it may be summarised as follows:—

Regimental Staff.—Officers 9, other ranks 29, horses 7.

Battalion Staff.—Officers 2, other ranks 2, horses 2.

Company (sappers and miners, railway, telegraphs and balloonists).—Officers 4, other ranks 118, 150, 130 and 118 respectively, horses 2.

The driver companies have a slightly different organisation with a far larger proportion of horses (80 to 120).

The artillery has also been considerably augmented. There will be—

In France.

- 11 regiments of foot artillery (42 coast and 47 fortress companies).
- 74 regiments of field artillery (729 field, 18 heavy, 14 mountain and 16 horse batteries).

In Algeria-Tunisia.

- 1 regiment of foot artillery (8 coast batteries) and 1 of field artillery (15 field and 4 mountain batteries).

There are also companies and sections of artisans, which are attached to batteries, as required. Of the organisation details which are given, the following seem of most interest:—

A coast battery consists of—officers 3, horses 3, other ranks 110 or 200 (Algeria).

A field battery has 3 officers, 77 or 128 other ranks, 18 or 19 riding and 30 or 90 draught horses.

A mountain battery has 3 officers, 127 or 128 other ranks, 8 or 19 riding horses, 6 or *nil* draught horses and 70 or 90 mules.

There are certain other minor changes in the train, and special services, telegraphs, etc.

MORAL OR MORALE.

A COMMENT BY COLONEL E. H. RODWELL, I.A.

The spelling of this word is discussed in your review for April 1908 and the Adjudicating Officer in the Tactical Scheme for July 1906 gives a very decided opinion on the subject. There are however two sides to every question. It may therefore be of interest to remark that having noticed that the late Colonel Henderson used the spelling "moral" which appeared to me a very confusing innovation in 1892, I asked Monsieur Deshumbert, Professor of French at the Staff College, Camberly, for his opinion on the subject. He said that the spelling morale with an "e" was undoubtedly correct, that the word in its military sense of spirit, etc., was thus spelt in French some two hundred years ago at which time it was adopted by English writers, and that this spelling had the advantage of distinguishing the abstract noun from the adjective. Much as we all admire the late Colonel Henderson's writings I do not think his spelling of this word is to be admired. It is also to be remarked that the retention of the "e" tends to preserve the long sound of the last syllable in English which might otherwise be wrongly pronounced "moral" in the same measure as legal, local, ducal, etc., etc. The fact is that this word morale in its particular sense should be looked on as an English word owing to time-honoured usage by the best English military writers.

REVIEW.

On War * By Von Clausewitz.

This treatise on war, written at the beginning of last century, by General Carl Von Clausewitz of the Prussian Army, and originally translated into English in 1873 by Colonel Graham, has this year been produced in the form of a new and revised edition containing an introduction and some explanatory notes by Colonel Maude, C.B. (late R.E.). To many soldiers this work requires no introduction, but there are doubtless others who are not acquainted with it, for these a short notice of the book with a view to inviting interest in it may be of use.

The author, who served in both the Prussian and Russian Armies, took part in the campaign of 1793-94 on the Rhine as well as in the 1806 and Waterloo campaigns; he served as Instructor of the General War School and as Director of the War Academy in Berlin and held important staff appointments with troops both in war and peace. The pictures he presents of war are the result of a large experience of it, both practical and theoretical.

The present edition of the book is published in three volumes which contain between them the eight "books," in which form the author originally arranged his writings. In the first volume are the introduction by Colonel Maude, some notes and memoirs concerning the author and the first four "books" which deal respectively with the nature and theory of war, strategy in general and the combat (also treated as a whole). The second volume contains the next two "books" which treat of the consideration of military forces and the defence. The first of these two subjects, as explained by the author, is held to include the conditions appertaining to an army which are necessary to fighting but which do not constitute the fight itself, such as strength, organisation, maintenance, etc. The last volume deals with the attack and with the organisation of a whole war and concludes with an appendix showing the course of instruction in strategy and tactics given by the author to the Crown Prince of Prussia.

Though the book was written so long ago this should not be considered as an argument against its usefulness for the present day soldier, at least in so far as those portions of the work which deal with strategy are concerned, for, as is pointed out in the introduction, whatever changes may be produced in the methods of war by the progress of science and invention, the essential spirit of war and its great principles never alter; the book affords a valuable study of this spirit and these principles.

So many phases of war are dealt with in the book that it is impossible in a limited space to remark on all or even most of them,

* Kegan, Paul, Trench, Trubner & Co., Ltd., Price £1 1s. (nett.)

the list of contents is clearly and fully put and from this the reader should have no difficulty in selecting his subject. But three important principles which are continuously put forward by the author, may be quoted: the first is that the one single means of pursuing war to its end is the combat, that the object of combat is the destruction of the enemy's fighting power, i.e., his army, and that every step in war should have in view the attainment of this object by this means; secondly, the unchanging principle that forces should not be frittered away on side issues but that all available strength must be concentrated at the decisive point; thirdly, that the defence by itself will never win in the end but must be combined with the offensive. These three principles are, at least, among the chief ones, with which, to quote the words of the introduction, "every soldier and above all every leader should be saturated." The author's conception of these will be found in the chapters on "The end and means of war," "The theory of war," "The combat in general" and "Superiority of numbers" and in the books on "Attack" and "Defence." In addition, the chapters on "Information in war," "The use of the battle" and those portions of book V which deal with marches, camps, cantonments, subsistence and ground may be especially noticed as treating of conditions which have changed but little since Clausewitz's day. The author's idea of the dividing line between strategy and tactics will be found at the commencement of book II.

The introduction by Colonel Maude forms a most interesting commencement to the work; in it, and following the principles enunciated by Clausewitz, the vital importance of being prepared for war is shown; this, in view of the trend of a certain section of public opinion towards military matters, is very applicable at the present moment.

In conclusion, the book is not light reading but this is held to be no disadvantage, for the certain amount of concentration which must be given in studying it should serve to impress on the reader's mind the lessons it offers.

Reconnaissance in the Russo-Japanese War, by "Asiaticus." Translated from the German by Captain J. Montgomery, 3rd Hussars. Published by Messrs. Hugh Rees, Ltd. Price 3s. 6d.

This book should prove of great interest to all serious students of the War in the Far East, the more so in that it presents us with a new aspect of that great struggle. As the translator remarks in his preface, no detailed account of the Reconnaissance during the Russo-Japanese War has yet appeared in English, so that this little book (it only contains some 150 pages and can be read through in 2 or 3 hours) should supply a want.

The same information as to events may possibly, in fact, certainly, be found in any of the more detailed accounts of the campaign,

both British and Continental ; but in this case it is carefully sifted and only the essential facts dealing with the reconnaissance on both sides are here set forth.

The most interesting part of the whole book, perhaps, is that describing the Japanese system of espionage. By means of a numerous and carefully organized secret service, in which two nations, *viz.*, Chinese and Koreans, were enrolled or impressed, in addition to their own people, the Japanese were enabled to dispense to a great extent with independent cavalry for the distant or strategical reconnaissance and employ their cavalry almost entirely for tactical reconnaissance in the immediate vicinity of the various armies. Consequently, although not brilliant and possibly somewhat deficient in the true cavalry spirit, the Japanese Cavalry did not suffer to any great extent from its very marked inferiority in numbers to the Russian arm.

The book, which is very readable, though in places the translation leaves something to be desired, is divided roughly into two parts: the first, an actual detailed account of the reconnaissance on both sides up to and including Mischenko's famous raid of the beginning of 1905; the second, and admirably lucid exposition of the lessons to be deduced for our future benefit.

It forms interesting reading and should, in addition, be useful to officers preparing for examinations.

The Russo-Japanese War on Land, by Captain F. R. Sedgwick, R.F.A. Published by Messrs. Forster, Groom & Co. (Price 3s. 6d. nett).

This recent addition to the literature dealing with the great War in the Far East will be useful as well as interesting to those who wish to gain a clear and comprehensive view of the whole campaign on land, without having to wade through a mass of detail. There are only 170 pages of fairly large type, so that there is no fear of wasting one's time in reading it through.

The scheme of the book is roughly as follows:—

After a short introduction, discussing the chief characteristics of the opposing forces and the Theatre of War, the main, and only the main, events and battles are taken in order one after the other and described briefly and clearly, with the aid of small scale maps. The minor tactics employed by each side are not discussed: only the strategy and grand tactics. Criticisms on the operations are taken, as the author himself asserts, from the various authoritative works on the subject, both British and Continental, but principally the latter.

The final chapter, entitled "General Notes" is one of the best features of the book. Though containing little that is new to one who has studied the war with care, it is very sound and clearly expressed, especially the lessons to be learned.

The chief blot on the book, which is otherwise admirable in every respect, is the carelessness with which it has been corrected, if indeed the proofs were corrected at all. There are far too many minor grammatical mistakes, as well as mistakes in names, e.g., "Tchikoff" for "Khilhoff", which in some cases confuse the meaning and irritate the reader.

The following sentence from page 144 is a typical instance, and in this case it is distinctly hard to see what the writer is driving at :

"General Kuropatkin's strategy was probably otherwise, though not brilliant, yet correct, until the time came to join battle, then, though at and after Liaoyang he always equalled or outnumbered his opponent, yet Oyama always managed to collect a superiority of force at the decisive point."

Notwithstanding these blemishes, it is a very clear and lucidly written little book and may be commended to the attention of all who have not the time or inclination to study the longer and more detailed accounts of the war.

Questions on Organization and Equipment, by Major T. King, late Berkshire Regt. Published by Messrs. Forster, Groom & Co. Price 6d.

In these days, when continual changes are taking place in the Organization and Equipment of our Army, it is very difficult for an officer who is preparing for his examination for promotion to know exactly what he is required to know on this subject or where to look for it. For this reason, this little pamphlet should prove useful to all officers preparing for examinations. It is no more than the title claims for it, i.e., it merely contains a number of questions likely to be set on Organization and Equipment, without either giving the answers or stating where the answers are to be found. At the same time, it is safe to say that any officer who could answer all these questions with some degree of accuracy would be practically certain to obtain very high marks in this somewhat difficult subject.

It is compiled principally for the officer who has elected to be examined on the Organization and Equipment of the Army at Home and, unfortunately, contains very few questions on the Army in India.

There is an useful appendix to the book, giving, diagrammatically, the composition of the various units of the Army, from a Brigade upwards, though these again only refer to the Home Establishments.

We have received from Messrs. Forster, Groom & Co., Ltd., Charing Cross, London, an excellent sketch map to illustrate the 1866 Bohemian Campaign with an inset map of the Battle of Koniggratz with notes and references regarding the operations, which will be found of much use in the study of this campaign. Price 2s. 6d.

Messrs. Gale and Polden, the well known Military Publishers, have added to their series of Military Books, by the recent publication of "A Guide to Promotion for Officers in Subject 'A' (Regimental Duties)," by Captain R. F. Legge, The Prince of Wales' Leinster Regt. Price 4s. (nett).

This book has been compiled by the Author, with a view to presenting to young Officers, in a handy form, the necessary information to assist them in preparing for promotion in Subject "A."

The necessary references to Text Books and Regulations have been given so that the reader can thus verify the facts for himself and at the same time become acquainted with the regulations on the subject. At the end of each Chapter questions are given on the subject matter. The information is clearly given and embodying, as it does, the numerous recent amendments to Regulations, it should prove extremely useful for the purpose for which it is written.

Apart from the merits of the book itself, it seems a pity that a regular catalogue (extending to 89 pages) of military books should be included at the end of the book. While admitting that it is a useful thing for Officers to know what are the recent military publications, still as most Officers have many of these military series books in their possession, the addition of these catalogues adds very considerably to the book space required.

The above criticism is made with all deference to the Publishers, Messrs. Gale and Polden, to whom all credit is due for the educational value of their military publications.

Handbook of the Maxim Gun : its Mechanism and Drill with Questions and Answers. Published by Messrs. Gale and Polden. Price 6d. (nett).

A handy and useful book to individuals who have studied the Maxim Gun and who for examination purposes or otherwise wish to test their knowledge.

The value of the book would be much increased if diagrams showing the parts and action of the gun were added.

TACTICAL SCHEME COMPETITION, JULY 1907.

WINNING SOLUTION.

By "PRO UTILITATE," MAJOR E. TENNANT, 20TH DECCAN HORSE,
REGISTRATION OFFICER.

References are to map H. which can be supplied on payment.

The SHAHO River is unfordable throughout, but its affluent from the south-east and the MAHMAD River are both fordable.

The country is cut up by shallow nullahs easily passable by Infantry but forming considerable obstacles to the movement of mounted troops and transport.

GENERAL IDEA.

A Red Force of all arms is operating about "W," 25 miles N.-E. of SHAHDADPUR against a Blue Force based on "X," 75 miles due E. of that place. An inferior Red Force is at "Y," 20 miles S.-W. of SHAHDADPUR, and is contained by a Blue Force of slightly superior strength. The Red Forces are in communication *via* "Z," 30 miles W. of SHAHDADPUR. The country people are favourable to the Blues.

In the beginning of April 1907, the Red Commander at "W" sees a favourable opportunity of taking the offensive against the Blues. He therefore wishes to call to him the Red Force at "Y." The bridges over the SHAHO are still intact. He instructs the Red Commander to endeavour to join him by the evening of 7th April. On the night of 5th-6th April the Red Commander at "Y" eludes the Blue Forces by a night march.

SPECIAL IDEA.

You are in command of the Red Advanced Guard consisting of troops as per margin. At 8 A.M. your Main Guard is about 6 miles S.-W. of SHAHDADPUR near KHAN MUHAMMAD NAHJO. The Red Main Body is 2 miles in rear. The Red Commander has impressed on you the necessity of securing the passages over the SHAHO, north of SHAHDADPUR.

At this time you receive the following from one of your Cavalry patrols:—

No. 5.

BUGIANJO.

7-20 A.M.

6-4-07.

TACTICAL SCHEME COMPETITION, JULY 1907.

The three stone bridges and the Railway bridge over the SHAHO, north of SHAHDADPUR, are intact. No signs of enemy.
(Sd.) A. B., &c., &c.

At 8-5 A.M. you receive the following :—
No. 4.

WADADANI.
7-30 A.M.
6-4-07.

Blue Cavalry Patrol advancing N.-W. from MARAK THAIM.
Now about 2 miles east of this place.

(Sd.) C. D., &c., &c.
No. 6. SADIK SEHTO.
7-30 A.M.
6-4-07.

From Sandhills Blue Cavalry visible near BHAN BHRANJO.
Appears to be advancing rapidly.

- (Sd.) A. B., &c., &c.
- Q. i.—Assume a suitable formation for your Advanced Guard, show it on the map in red and write an appreciation of the situation.
- Q. ii.—State what action you would take on receiving the reports above mentioned. Mention precisely how your orders would be worded or written.

APPRECIATION.

The formation of the advanced guard is shown on the map, the time being 7-30 A.M. on the morning of the 6th April.

The reasons for assuming these positions are as follows :—

Cavalry.—The possession of the bridges over the SHAHO is of vital importance and therefore the cavalry are sent on well ahead, both to secure them and also to reconnoitre.

Two troops are in advance—one on each side of the road, from which reconnoitring patrols are sent forward as required. The remainder are moving, concentrated, along the HALA-SHAHDADPUR road, ready to afford support wherever required. (Cavalry Training, Sec. 153-154.)

Vanguard.—"The vanguard is generally composed of the advanced guard mounted troops.....By day, when the country is openinfantry will not as a rule form part of vanguard." (Comb. Training, 58 (2).)

Accordingly I place the M. I. with the vanguard. The success of our undertaking and the fruits of our successful night march depend upon our forestalling the enemy at the river, and the fact of the G. O. C. having given me Horse Artillery would seem to imply that he is prepared to risk much in order to secure the bridges. The main body cannot reach the river much before noon and therefore I must endeavour to delay the advance of any hostile troops as long as possible. This will be best done by opening fire at long range.

Accordingly I place the guns with the vanguard.

Main Guard.—"The mainguard comprises the troops of the A. G. not allotted to the vanguard," *i.e.*, in this case, the battalion of infantry and transport.

Position of O. C. Advanced Guard.—I decide to march with the vanguard. My force is endeavouring to reach "W" by the evening of the 7th April, to do which it must march 45 miles in about 40 hours. The road crosses the SHAHO just about midway between "W" and "Y," therefore unless I effect the passage to-day I shall not be able to count upon effecting the junction with the main army to-morrow evening.

My communications with "Y" having hitherto been *via* "Z," it is evidently a stroke of luck, finding the bridges intact and such luck must be treated by bold action.

The Blue force based at "X" has had no cause to send reinforcements west, as the containing Blue force, which I have eluded, was in no danger, being superior to my force. It is therefore a fair deduction to estimate the sighted Blue cavalry as a reconnoitring force hardly likely to be supported by other arms.

From an examination of the map it appears that the sand hills at SADIK SEHTO, from which my cavalry have been able to see to BHAN BHRANJO, afford commanding ground for hostile guns shelling the bridges. It will therefore be advantageous to secure the KAMILLAGARI range and this is emphasized by the absence of any other defence position covering the bridges.

The deep banks of the SHAHO afford a favourable position for defence by rifle fire.

In addition to the bridges in the vicinity of SHAHDADPUR there is another passage at GOLOPIR. To use this would involve a detour for the already tired troops and also the passage of the unbridged MAHMAD river, which, although fordable would cause delay. Should, however, it be found that the crossings at SHAHDADPUR are interrupted I may have to resort to this bridge.

With regard to the Blue patrol reported from WADADANI, the information is not sufficient to cause me to make any special dispositions. The troop of cavalry which is out in that direction, will drive back the patrol and clear up the situation. Further action will depend upon the nature of the reports sent in.

At 8-5 A.M., the time I receive the information about the enemy, I shall be with the vanguard somewhere between the 10th and 11th milestones on the SHAHDADPUR road.

"Occasionally it may not be practicable to issue definite Operation Orders to a Commander acting independently. In such cases only the object to be attained should be explained." (C. T., Sec 3. (18).)

Accordingly I issue the following instructions :—

MAIN ROAD, 4 M. S. W. OF SHAHDADPUR

6th April 1907, 8-10 A.M.

No. 17.

TACTICAL SCHEME COMPETITION JULY 1907.

The three stone bridges and the Railway bridge over the SHAHO, north of SHAHDADPUR, are intact. No signs of enemy.

(Sd.) A. B. &c. &c.

At 8.5 A.M. you receive the following :-
No. 4.

WADADANI

7.30 A.M.

6-4-07

Blue Cavalry Patrol advancing N.W. from MARAK THAM.
Now about 2 miles east of this place.

(Sd.) C. D. &c. &c.

No. 6.

SADIK SEHTO.

7.30 A.M.

6-4-07

From Sandhills Blue Cavalry visible near BHAN BHRAHO.
Appears to be advancing rapidly.

(Sd.) A. B. &c. &c.

Q. c.—Assume a suitable formation for your Advanced Guard
show it on the map in red and write an appreciation
of the situation.

Q. d.—State what action you would take on receiving the
reports above mentioned. Mention precisely the
your orders would be worded or written.

APPRECIATION

The formation of the advanced guard is shown on the map at
time being 7.30 A.M. on the morning of the 6th April.

The reasons for assuming these positions are as follows.

Cavalry.—The possession of the bridges over the SHAHO is
of vital importance and therefore the cavalry are sent on well advanced
both to secure them and also to reconnoitre.

Two troops are in advance—one on each side of the river, from
which reconnoitring patrols are sent forward as required. The
remainder are moving concentrated along the HALA SHAHDAD
PUR road ready to afford support whenever required. (Cavalry
Training Sec. 153-154.)

Vanguard.—The vanguard is generally composed of the
advanced guard mounted troops. By day when the enemy is visible
the infantry will not as a rule form part of vanguard. (Cavalry
Training Sec. 20.)

Accordingly I place the M.F. with the vanguard. The success
of our undertaking and the fruits of our successful negotiations
depend upon our forestalling the enemy at the river and the
at the G. O. C. having given me Horse Artillery was I am
imply that he is prepared to risk much in order to secure the bridge.
The main body cannot reach the river much before noon and
for I must endeavour to delay the advance of my horse artillery
as long as possible. This will be best done by opening fire at long
range.

Accordingly I place the guns with the vanguard.

Main Guard.—"The main guard comprises the troops of the A. G. not allotted to the vanguard," i.e., in this case, the battalion of infantry and transport.

Position of O. C. Advanced Guard.—I decide to march with the vanguard. My force is endeavouring to reach "W" by the evening of the 7th April, to do which it must march 45 miles in about 40 hours. The road crosses the SHAHO just about midway between "W" and "Y," therefore unless I effect the passage to-day I shall not be able to count upon effecting the junction with the main army to-morrow evening.

My communications with "Y" having hitherto been *via* "Z," it is evidently a stroke of luck, finding the bridges intact and such luck must be treated by bold action.

The Blue force based at "X" has had no cause to send reinforcements west, as the containing Blue force, which I have eluded, was in no danger, being superior to my force. It is therefore a fair deduction to estimate the sighted Blue cavalry as a reconnoitring force hardly likely to be supported by other arms.

From an examination of the map it appears that the sand hills at SADIK SEHTO, from which my cavalry have been able to see to BHAN BHRANJO, afford commanding ground for hostile guns shelling the bridges. It will therefore be advantageous to secure the KAMILLAGARI range and this is emphasized by the absence of any other defence position covering the bridges.

The deep banks of the SHAHO afford a favourable position for defence by rifle fire.

In addition to the bridges in the vicinity of SHAHDADPUR there is another passage at GOLOPIR. To use this would involve a detour for the already tired troops and also the passage of the unbridged MAHMAD river, which, although fordable would cause delay. Should, however, it be found that the crossings at SHAHDADPUR are interrupted I may have to resort to this bridge.

With regard to the Blue patrol reported from WADADANI, the information is not sufficient to cause me to make any special dispositions. The troop of cavalry which is out in that direction, will drive back the patrol and clear up the situation. Further action will depend upon the nature of the reports sent in.

At 8-5 A.M., the time I receive the information about the enemy, I shall be with the vanguard somewhere between the 10th and 11th milestones on the SHAHDADPUR road.

"Occasionally it may not be practicable to issue definite Operation Orders to a Commander acting independently. In such cases only the object to be attained should be explained."
(C. T., Sec 3. (18).)

Accordingly I issue the following instructions:—

MAIN ROAD, 4 M. S. W. OF SHAHDADPUR

6th April 1907, 8-10 A.M

No. 17.

To Major P., Commanding Advanced Guard Cavalry.

Cross the river and engage the enemy. Endeavour to draw him eastwards, while being sure to cover the bridge at BUGIANJO and if possible that at SHAH ALI NIZAMANI. O. C. is sending M. I. to hold BUGIANJO and hopes to bring the hostile cavalry under gun fire from sand hills N. of river. Reports to BUGIANJO.

A. B., MAJOR,

Staff Officer to O.C. A.G.

The O. C. Vanguard received a copy of the above and is given a verbal order (No. 18) to "move at a gallop on BUGIANJO."

(I shall accompany him and therefore no further orders are required at present.)

The following order is sent to O. C. Mainguard.

MAIN ROAD, 4 M.S.W. of SHAHDADPUR.

6th April 1907, 8-12 A.M.

No. 19.

To Lieut.-Colonel Y., Commanding Mainguard.

Patrols report hostile cavalry seen at 7-30 A.M. advancing from BHAN BHRANJO. Have ordered our cavalry to cross river and engage enemy—M.I. and R.H.A. moving at gallop on BUGIANJO—Push on to SHAHDADPUR.

Reports to BUGIANJO.

A. B., MAJOR,

Staff Officer to O.C. A.G.

The mainguard, cheered by the news of a possible engagement, changes its pace to 4 miles an hour.

(The G. O. C. is informed of presence of enemy and action taken.)

REMARKS BY THE ADJUDICATING OFFICER.

Nine solutions were received. Those of "Slasher," "Kyang" and "Per ardua surgam" were in merit almost equal to that of the winner "Pro utilitate."

The problem calls for instant action on the part of the Red A. G. Commander.

The information as to the Blue forces which are approaching the bridges is rather indefinite and is such as could only be obtained by the Red patrols at the time when they sent in their reports. Whether the Blue Cavalry is part of the force which has been containing the Red force at "Y" or whether it has been detached from the Blue force based on "X" makes little difference. The Red A. G. Commander has in any case no time to lose.

I think "Pro utilitate" has dealt with the formation of the A.G. adequately. He gives the formation as at 7-30 A.M. If, however, he had put his H. A. Battery and the bulk of his M. I. with his cavalry somewhat further in advance of the infantry I think such action would have been fully warranted.

As to the situation and the action I agree that too much importance need not be attributed to the advance of a Blue patrol

from **MARAK THAIM**. The sandhills west of **MISHU SHAH** afford a position from whence artillery might check any advance of the Blues from **MARAK THAIM** on the Railway Station and the necessary action could probably be taken by the O. C. Main Body.

The important thing is to secure the bridges at **BAHADUR KALVI** and **BUGIANJO**, and this could be accomplished by seizing the sandhills north of **BAHADUR KALVI** and also, if possible, those north-west of **SADIK SEHTO**. The fact front artillery could form a position west of **KHAS KHALI**, sweep the approaches to the bridges from the north and thus greatly facilitate this passage in the face of opposition should I think have been considered.

The question of holding the bridge at **GOLO PIR** until the Red Main Body had crossed the **SHAHO** is perhaps scarcely part of the problem.

As instant action was required the orders and messages should have been as brief as possible, and I think they would, in the circumstances, have been mostly verbal. Some of the solutions gave orders and messages at considerable length, but I was unable to give them many marks even when good in themselves.

TACTICAL SCHEME COMPETITION, OCTOBER 1907.

A few solutions only were submitted for the Tactical Scheme Competition of October 1907. The solution by "*Mea culpa*," Captain E. G. Hart, Supply and Transport Corps, has been adjudged to be the best of those submitted. The Committee has decided not to publish the winning solution of this competition, but the following criticisms may be of interest to such of the members as attempted to solve the scheme.

The scheme was modelled on the situation as it presented itself to McMahon at the commencement of the Franco-Prussian war when the French were compelled to adopt the defensive owing to their mobilisation being slower than that of the Germans. The troops on either side were practically proportionate to those actually engaged at Woerth, where McMahon endeavoured to stem the invasion of the 3rd German army under the Crown Prince.

The problem was not an easy one, a fact which probably accounted for the paucity and weakness of the solutions. It is considered, however, that with a little care some of the solutions might have been greatly improved. For instance, after it had been clearly stated in the scheme that the opposing cavalry had been in touch along the frontier for several days, one solver sent contact squadrons several miles across the border. The rôle of the different arms was not always understood. Cavalry were, in one case, detailed to hold the centre of a defensive position, instead of being employed on the flanks or concentrated in rear. Again a reserve was frequently omitted.

Several solvers had not taken the trouble to ascertain exactly the composition of a division on the Indian establishment.

Mistakes, such as those described, should certainly have been avoided.

THE JOURNAL

OF THE

United Service Institution of India.

Vol. XXXVII.

October 1908.

No. 173.

GOLD MEDAL PRIZE ESSAY, 1908.

The manner in which the Infantry Attack can best be supported by Artillery Fire, having regard to the present system of Artillery Training and to recent improvements in material.

BY MAJOR H. S. JEUDWINE, ROYAL ARTILLERY.

MOTTO.—“ *Plus l'infanterie est bonne, plus il est important de l'appuyer par des batteries, afin de la ménager.*”

(Maximes de Guerre.)

“ Il n'y a point d'ordre naturel de bataille. Tout ce que l'on prescrirait la-dessus serait plus nuisible qu'utile.”

“ La tactique, les évolutions, la science de l'ingénieur et de l'artilleur peuvent s'apprendre dans des traités, à peu près comme la géométrie ; mais la connaissance des hautes parties de la guerre ne s'acquiert que par l'étude de l'histoire des guerres et des batailles des grands capitaines, et par l'expérience. Il n'y a point règles précises, déterminées ; tout dépend du caractère que la nature a donné au général, de ses qualités, de ses défauts, de la nature des troupes, de la portée des armes, de la saison et de mille circonstances qui font que les choses ne se ressemblent jamais.”

Maximes et Pensées de l'Empereur Napoléon Premier.

ARRANGEMENT OF THE SUBJECT.

PART I.—Introduction—How the difficulties attending artillery support have originated.

„ II.—Recent tactical developments and the influence they exert on modern operations, and especially in the course of the attack.

„ III.—Present systems of artillery training and recent improvements in material.

„ IV.—Measures to be taken for the support of infantry by artillery—

(a) in peace,

(b) immediately before or during the different phases of an action.

„ V.—Observations on special operations.

„ VI.—Summary.

PART I.

Introduction—How the difficulties attending artillery support have originated.

It is impossible to peruse current military literature without being impressed by the emphasis which is given to the necessity for the support of infantry by artillery, and by the frequency with which the means of securing it are discussed. A student who began his study of tactics with the contemporary lessons which are still being extracted from the latest operations might almost imagine that the importance of supporting infantry by artillery fire had only just been discovered, and might wonder why a great truth which attracts so much attention at the present day had eluded discovery for so long. But if he were to extend his enquiries to the histories of past operations he would be unable to find, in the period since artillery first took the field, any time when this principle was not acted upon by those who were successful in war, although, perhaps, they made less stir about it than we do now. Why then, he might ask, is it that a principle which is as old as artillery itself has of late years assumed a prominence so unprecedented? The reason is not far to seek. When, of old, infantry and artillery fought in combination they did so side by side, within the limits of clear human vision, and within the range of human voice. Each saw what the other was doing, heard the commands that were given, comprehended the difficulties that arose, understood the object to be achieved at the moment. No scheme for co-operation was needed; the requirements of the moment were obvious and co-operation was usually as automatic as is that of a man's two fists. Even supposing orders were required to ensure such co-operation, these could often be given to units during the

stress of battle by the commander of the force in person, or at all events by a galloper or staff officer despatched from the point of vantage close at hand whence he was watching the engagement. Hence the support of infantry by artillery was a thing to be confidently expected, and gave rise to no anxiety. It was only when ranges began to lengthen and extensions to get wider that commanders and tacticians began to be troubled about the matter. Failures occurred, and a vague uneasiness prevailed. There was no question as to the principles involved, but the action best suited to their observance was in doubt. Artillery went into battle resolved to support its infantry, but somehow when the need of doing so was most pressing it often found itself physically incapable. The end of each war brought experience which it was thought would bear fruit in the next. But when the next war came ranges had become longer still, and fronts still more extended. The solution of the difficulty was as far off as ever. The introduction of smokeless powder brought with it additional complications. It became obvious that whoever could solve this great problem of co-operation would have an immense advantage against an adversary who had not succeeded in doing so, an advantage so enormous that victory would in all probability accompany it. Hence the feverish quest for unailing systems of co-operation which we see reflected in the military literature of to-day.

It was in the literature dealing with the events of the campaigns of 1866 and 1870-71 that the subject first took a prominent place.* But the difficulties of that day were as nothing to those of our own, and the methods which then appeared likely to yield a satisfactory solution of the problem would be of small assistance now. Other wars since that of 1870-71 have periodically revived interest in the question. Our late war in South Africa and the Manchurian campaign seem to have brought matters to a head.

But although the difficulties experienced in ensuring proper co-operation during both these campaigns were severe enough in comparison with those of previous operations, it is probable that in wars to come they may be more arduous still.

The circumstances of attack in these days of long ranging, rapid-firing, flat-trajectory rifles compel the assailant to expose himself to a much greater extent than the defender. The depth of the fire-swept zone condemns him to undergo this exposure for a much longer time than was formerly the case. If the attacking infantry is to reach decisive ranges in a condition for further effort, and finally to close with its antagonist in the spirit of confidence and determination which is essential for a successful issue, it must be spared all avoidable loss during the advance.

* See especially "Letters on Artillery," "Letters on Infantry"—by Prince Kraft zu Hohenlohe Ingelfingen. Translated by Colonel Walford. Published by the Royal Artillery Institution, 1887.

PART II.

Recent tactical developments and the influence they exert on modern operations, and especially in the course of the attack.

As a preliminary to considering how support can best be given by artillery to an infantry attack, it is essential to appreciate the conditions under which this attack will be made. It will, therefore, be convenient in the first place to notice the tendencies exhibited by some of the more recent tactical developments, and next to sketch briefly the influence which these exert on the conduct and progress of an attack.

Among modern tactical developments may be mentioned the following :—

Increased use of cover.—This, the natural result of improved firearms, was exemplified in South Africa and Manchuria, and although the extent to which cover was used in the latter campaign may have been partly due to abnormal circumstances. There can be no kind of doubt that the long ranges and flat trajectories of the present day will necessitate recourse to cover, natural and artificial, by both sides, and by both the arms with which we are dealing, in a greater or less degree throughout the action. It is the defender, however, who will have the better opportunity for the construction of cover, and, so far as infantry is concerned, the more to gain by doing so.

Difficulty of reconnaissance.—This is due to the long effective ranges and rapid fire of modern weapons, to the use of cover, and to the adoption of smokeless powder. The collective result of these is to render it possible to inflict loss on an advancing opponent without affording him more than the barest indication of the direction from which he is being engaged, and of the strength of the force opposed to him.

The increased difficulties of the advance during the later stages of an attack.—The flatter trajectories and more rapid fire of the present day have deepened the danger zone and rendered the volume of fire more dense, whether of musketry or shrapnel. The result is that an advance within decisive ranges against an unshaken defender is an operation too costly to be undertaken except as a forlorn hope, and is condemned almost infallibly to failure. It is generally recognized that a successful assault will be impossible unless the antecedent fire action has demoralised the defenders.*

The efficacy of enfilade fire.—Long ranges and flat trajectories have made enfilade fire more deadly. Small bodies which succeed in establishing themselves on the flanks of an opponent in position may often produce an effect out of all proportion to their strength.

* "L'assaut n'est que la consécration d'une victoire préalable obtenue par le feu." Preparation et exécution de la bataille. Revue Militaire Générale.—January 1907.

This was one of the most noticeable lessons of the Manchurian Campaign. The Russians, stubborn fighters though they proved themselves, repeatedly fell back when threatened by the fire of inferior numbers from a flank.

The prevalence of enveloping attacks.—Mainly as a result of the great difficulty attending the frontal attack, and of the efficacy of enfilade fire, enveloping attacks now find great favour with tacticians of all nations. They were constantly practised by the Japanese in the late war, and the thoroughness with which they were executed was most marked. At the same time that envelopment was in progress, a steady pressure was maintained along the front, and by this means the reinforcement of the threatened flanks was made impossible. But unless numbers favour the attack the accomplishment of such an operation is attended with great risk, since, in order to give the necessary extension to the attack, depth must be sacrificed in some parts of the field. Consequently an active defender, if skilful enough to divine the dispositions of his opponent, is provided with an opportunity for counter-attack which he is unlikely to neglect.

Long duration of battles.—There is less unanimity on this point than exists in the case of most of the foregoing.* Without going so far as to assert that the duration of battles will in all cases be prolonged to the extent to which it was in the Russo-Japanese War, it cannot be doubted that the increased use of cover, the length of effective ranges, the difficulties of reconnaissance, and the holding power of the magazine rifle, will exert a strong influence in this direction in all important engagements.

The frequency of night operations.—The conditions which have been alluded to in the foregoing paragraphs tend to make movement on the battle field by day difficult, or even impossible. Advance or change of position will, therefore, often have to be deferred till nightfall, and collisions, accidental or intentional (as in the case of a night assault) may be expected to occur not infrequently in darkness. This has been fully exemplified in the most recent campaign.

The influence exerted by modern conditions of war on the course of the attack.—It is in the highest degree undesirable to allow ourselves to imagine an attack as conforming invariably to a particular model. To do so is not only to violate the principles of our training manuals which refuse to countenance any stereotyped form of attack,† but also to disregard the dictates of common sense. Variations in ground alone are sufficient to prevent any two instances from presenting exactly similar conditions, without taking into account the numerous other factors whose value varies in a corresponding degree. Besides ground, numbers, moral, weather, composition of forces, personal attributes of commanders, and a hundred other uncertain factors, combine to produce a given situation. In no two instances are all these factors the

* See particularly "Operations of War." Hamley. 1907 edition, revised by Kiggell.

† See "Infantry Training," Section 124.

same, and consequently in no two situations in war are the circumstances exactly similar. Nevertheless there are general characteristics which will find expression in almost every attack and enable us to recognize in each the recurrence of certain phases. These phases may for convenience be referred to under the heads which follow:—

- (a) *The reconnaissance.*—As soon as contact is established by the advanced troops the first aim of the attack will be to discover the dispositions of the adversary—what localities he holds and in what strength; the extent of his main position, and of any detached posts. To effect this a steady pressure will be exerted against the defenders' position, and effort will be made to force him to disclose his dispositions, while the attacker at the same time will avoid, if possible, committing himself to a particular course of action. Minor attacks, however, on particular points may have to be undertaken, each of which will present characteristics similar to those exhibited in the attack at large. From an appreciation of the situation, as revealed to him by the intelligence obtained during the reconnoitring stage, the commander of the attacking force must judge what plans to adopt for the advance on the main position.
- (b) *The advance to decisive range.*—The main object of the attacker during this stage is the building up of a strong firing line within decisive range of that part of the defenders' position at which it is intended ultimately to drive the attack home. Other operations concurrently undertaken, such as holding attacks against other parts of the position with the design of deceiving the enemy and of immobilizing troops which he might devote to the reinforcement of the main point of attack, are merely subsidiary to the establishment of fire superiority over the defenders occupying that portion of the position against which the supreme effort is to be made.
- (c) *The establishment of superiority of fire.*—It is to this end that the previous operations will have been directed. To obtain a sufficient volume of fire a dense firing line at decisive range will be a necessity. In order that this dense line may not suffer such loss as will render it incapable of further advance it must be supported and protected by every means possible.
- (d) *The assault.*—This, the culminating operation of the attack, is, as has been already pointed out, merely the realization of a victory previously obtained by fire. It cannot succeed against a defender whose opposition has not been subdued by fire, while at the same time

fire alone, though it may induce indifferent troops to evacuate a position, will not suffice to rout those imbued with the determination of the true soldier.

- (e) *The occupation of the position.*—This will be undertaken immediately the assault is successful to safeguard the advantage won. Rapidity may be essential in its execution since the confusion necessarily resulting from an assault renders the victor especially vulnerable to counter-attack by fresh troops.

In the foregoing observations the endeavour has been made to confine attention to those points which are common to the subject of attack in general. For this reason counter-attack has not been specifically referred to. But it must be clearly recognized that no defender who looks forward to ultimate success will confine himself, either locally or in large operations, to a passive defence. He may assume a defensive attitude with the view of launching a counter-attack on a certain predetermined plan, and to this end he may so shape his dispositions as either to create the opportunity he desires, or to force the enemy, by committing himself to a certain line of attack, to create it for him. Or he may retain a reserve in hand for the purpose, with the intention of applying it whenever and wherever an opening occurs. But whatever course he adopts, the operations devolve into attack on the one side and defence on the other, the positions possibly being reversed in different parts of the field. This being the case it appears that the preceding general observations on the attack are applicable to all such situations. Reference to co-operation in counter-attack will be made later.

The views expressed, and conclusions arrived at, in this part are in the main an abridgment of those contained in official publications and others which have received either official sanction or the support of general opinion*.

PART III.

Present systems of artillery training and recent improvements in material.

The thesis of the essay directs that the subject is to be treated with reference to "the present system of artillery training and to

* Among others the following have been drawn upon. Arguments and deductions will be found set forth in them at greater length :—

"Combined Training," 1906 (as amended).

"Infantry Training," 1905 (as amended).

"Field Artillery Training," 1906 as amended).

"Operations of War"—Hamley—1907. Revised by Kiggell.

"Tactics of the Three Arms," Henderson (Science of War).

Essays for the Duncan Medal, 1907. Journal of Royal Artillery Institution, July, 1907.

"Notes upon Company and Battalion Tactics, and the employment of Artillery in Battle," Degtyarev. Journal of the R. U. S. I. January, 1908.

"Tendances francaises et allemandes relatives a'la preparation et á l'exécution de la bataille." Revue Militaire Générale. January, 1907.

Narratives of Operations in Manchuria.

Von Lobel's year book for 1906.

German Regulations for Artillery.

recent improvements in material." It is, therefore, desirable to consider briefly what these are before proceeding to definite suggestions for the action of the artillery.

Present systems of artillery training.

The salient features of present systems are :—

- (1) The practice of conducting fire from concealed positions by indirect laying.
- (2) The system of ranging with time shrapnel.
- (3) The system of searching or of searching and sweeping fire, i.e., the bombardment of a certain area by means of very rapid fire distributed over it.

(1) Fire from concealed positions.—The advantages of this system are that it secures immunity from severe losses, and enables guns to remain unobserved either in a position of readiness to open fire, or in action.

Its disadvantage is that on the whole it diminishes effect. The time occupied in opening fire, or in changing the objective, is usually greater than when direct laying is employed; moving targets are less easily engaged; and unless a convenient observing station for the battery commander is available in proximity to the battery, complications are introduced, in the shape of visual or telephonic communications, which are liable to lead to breakdowns or misunderstandings. Moreover, such positions imply the existence of dead ground in front of the guns. This disadvantage, however, is of relatively less importance in the attack.

(2) Ranging with time shrapnel.—This has the advantage of making an effective fire possible from the first, an important matter in the case of fleeting targets.

The disadvantages are that an exact knowledge of the angular difference in level between gun and target (called the angle of sight) is required, and that laying, and setting of fuzes must be most accurate to obtain satisfactory results.

(3) Searching, or searching and sweeping fire.—This system aims at making it possible to inflict loss quickly on an enemy whose exact whereabouts are unknown, provided that he can be located within moderate limits—say within a depth of about 400 yards from a visible feature on which ranging can be carried out. But it entails a great expenditure of ammunition for a rather problematical result.

Recent improvements in material.

The most noticeable of these are :—

- (i) A quick-firing design of carriage for field guns, absorbing in itself the energy of recoil, and provided with an independent line of sight, allowing, in conjunction with a quick loading gun, a very high rate of fire (some 15 rounds a gun a minute), to be maintained on emergency.

- (ii) Shields, conferring on the detachment protection against frontal fire, except that with a steep angle of descent.
- (iii) Indirect laying apparatus—dial sights, directors, plotters, etc., which allow fire to be directed from under cover at objects unseen from the gun.
- (iv) Telephone equipments, easily carried and rapidly laid out, which facilitate communication between units of artillery and the higher commanders, or between artillery and infantry, and enable a battery commander to exercise command of his battery from a distant observing post, or to receive reports on the effect of his fire from the latter.
- (v) An improved design of field howitzer firing effective shrapnel from a great range with a steep angle of descent.
- (vi) Heavy mobile guns with great range and shell power.
- (vii) Quick-firing equipments for mountain artillery on the same lines as those for field artillery.

PART IV.

Measures to be taken for the support of infantry by artillery—

- (a) *in peace,*
- (b) *immediately before or during the different phases of an action.*

Having cleared the ground by an appreciation of the main characteristics of the infantry attack, of present systems of artillery training, and of recent changes in artillery material, we are now in a position to discuss in detail the manner in which the infantry attack is to be supported by artillery, and to put forward definite proposals.

In the first place it seems that the measures to be taken for ensuring effective support of the infantry may be divided into two classes, *viz.*,—

- (i) Measures to be taken during peace.
- (ii) Measures to be taken in or immediately before action.
- (i) Measures to be taken in peace.

We read in Combined Training, Section 110, that "The effective combination of the three arms depends to a great extent on the knowledge possessed by all leaders of the means by which the powers of their weapons can be best employed for the object in view."

This passage clearly implies that knowledge of this kind must be acquired before action. The greatest aid to this knowledge is a thorough mutual understanding between the two arms with which we are at present concerned. Such an understanding can be implanted and developed in peace. An artillery officer should be able to interpret all the signs offered by movements of infantry in the attack as seen from his position with the guns. From

the occurrences actually observed he should be able to divine others which are outside his vision. For instance, a sudden advance of supports some distance in his front, the forward movement of ammunition carts or mules, and perhaps a louder rattle of musketry should at once suggest to him that the firing line in that vicinity is probably being hardly pressed. He should be able to form a fairly accurate idea of the situation of the firing line which may, likely enough, be hidden from him by some feature of the ground. This may help him to locate the causes of pressure—perhaps a hostile battery which has just opened fire, or a local counter attack which has been unexpectedly encountered and to come to the aid of the infantry.

An infantry officer should know whether this or that line of advance will mask the fire of the guns supporting him and be able to appreciate the advantage he will gain by directing his approach, say, up a certain steep slope which will enable fire to be continued by the artillery up to the moment of contact, in preference to adopting a line of advance which may be more direct and across easier ground, but which will bring his men, while still at a distance from their opponent, into danger from the fire of their own artillery, and so necessitate an earlier cessation of the latter's fire.

It is believed that intuitive understanding by each arm of the conditions affecting the other at different phases of the battle can only be acquired by the officers of each actually serving with the other, and actually encountering, at all events in peace manœuvres, the difficulties by which it is faced.

It is, therefore, proposed that it should be looked upon as part of the ordinary education of an officer of the artillery or infantry to be attached for a training season to the sister arm, and that no subaltern should, as a rule, be regarded as eligible for promotion to Captain who has not undergone this experience. It is believed that any inconvenience which might be caused by the withdrawal of an officer for a time from his own unit would be amply compensated for by the increased familiarity which each arm would gain with the other's methods and by the introduction of closer relations, social as well as professional.

In most cases no expense need be incurred in carrying out such a measure. Only in the infrequent cases where an officer happened to serve for a long period at stations not occupied by both arms would some expenditure in travelling have to be incurred.

(ii) Measures to be taken immediately before or in action.

The endeavour will now be made to suggest suitable measures in the order in which they will require to be put in force immediately before and during an action. Special circumstances, such as night operations, mountain warfare, and counter-attacks will be referred to later. It will be convenient to deal with the different phases of the battle in turn, in the order in which they have already been referred to in Part II.

(a) The Reconnaissance.

As soon as contact is established the general officer commanding will proceed to make his reconnaissance with a view to formulating his plan for opening the action. This plan must include designs for the concerted action of artillery and infantry. The action of artillery will be dependent to a great extent on technical considerations. It will, therefore, be necessary for the artillery commander to reconnoitre concurrently with the general officer commanding. He will employ such artillery officers as he requires to assist in this reconnaissance. When it is completed he will rejoin the general officer commanding, preferably at some place affording an extensive view of the field of operations, and will be prepared to advise him as to the positions which can be occupied with the best hope of effect by the artillery, and the localities occupied, or believed to be occupied, by the enemy on which the most concentrated fire can be brought to bear. These considerations affecting the employment of the artillery will form, as it were, the framework on which the whole plan for the concerted action of both arms will be composed. The general officer commanding having made up his mind as to the line of action he intends to pursue, will issue detailed operation orders, and in these will allot to the artillery its task in more or less detail. He will also make the artillery commander very fully acquainted with his intentions so far as he himself is able to develop them, having regard to the very imperfect knowledge of the enemy's dispositions, and of the local topographical features which will be available to him at this period. The action in its early stages will mainly consist in feeling for the enemy. As steady pressure will be kept up over a wide front, and the enemy's dispositions will be judged by the force he shows, and the amount of resistance met with at different points in this front. The pressure will be begun by the infantry, and sooner or later the enemy, rather than allow them to establish themselves without loss in close proximity to the positions he holds, will be forced here and there to show his hand. The opportunity will then be offered for artillery action, and wherever the enemy shows himself fire will be opened on him. Such fire will be more of a provocative nature than with a view to great effect. The object will be to draw the defender's troops and especially his artillery into action. Heavy artillery with its long range may be particularly useful. Perhaps dummy batteries firing puffs, or real batteries opening fire out of range of the defender may induce reply.* If the defender's artillery has not already opened fire such action will probably force him to do so. By degrees the enemy's dispositions will become more fully known. Until such knowledge is gained, however, the exact action required of the attacking artillery will be in doubt. It will, therefore, be unwise to commit more of it than is necessary to positions

* The Japanese used both these devices on the Sha-ho. See "Q. F. Guns in the Russo-Japanese War." De Castres de Tersac. Translation in R. A. Journal. September, 1907.

ARRANGEMENT OF THE SUBJECT

PART I.—Introduction—How the difficulties attending artillery support have originated.

„ II.—Recent tactical developments and the influence they exert on modern operations, and especially in the course of the attack.

„ III.—Present systems of artillery training and recent improvements in material.

„ IV.—Measures to be taken for the support of infantry by artillery—

(a) in peace,

(b) immediately before or during the different phases of an action.

„ V.—Observations on special operations.

„ VI.—Summary.

PART I.

Introduction—How the difficulties attending artillery support have originated.

It is impossible to peruse current military literature without being impressed by the emphasis which is given to the necessity for the support of infantry by artillery, and by the frequency with which the means of securing it are discussed. A student who begins his study of tactics with the contemporary lessons which are still being extracted from the latest operations might almost imagine that the importance of supporting infantry by artillery fire had only just been discovered, and might wonder why a great truth which attracts so much attention at the present day had eluded discovery for so long. But if he were to extend his enquiries to the histories of past operations he would be unable to find, in the period since artillery first took the field, any time when this principle was not acted upon by those who were successful in war, although perhaps they made less stir about it than we do now. Why then he might ask is it that this principle which is as old as artillery itself has of late years assumed a prominence so unprecedented? The reason is not far to seek. When, of old, infantry and artillery fought in combination they stood side by side within the limits of clear human vision, and within the range of human voice. Each saw what the other was doing, heard the commands that were given, comprehended the difficulties that arose, understood the object to be achieved at the moment. No scheme for co-operation was needed; the requirements of the moment were obvious and co-operation was usually as automatic as is that of a man's two fists. Even supposing orders were required to ensure such co-operation these could often be given to units during the

stress of battle by the commander of the force in person, or at all events by a galloper or staff officer despatched from the point of vantage close at hand whence he was watching the engagement. Hence the support of infantry by artillery was a thing to be confidently expected, and gave rise to no anxiety. It was only when ranges began to lengthen and extensions to get wider that commanders and tacticians began to be troubled about the matter. Failures occurred, and a vague uneasiness prevailed. There was no question as to the principles involved, but the action best suited to their observance was in doubt. Artillery went into battle resolved to support its infantry, but somehow when the need of doing so was most pressing it often found itself physically incapable. The end of each war brought experience which it was thought would bear fruit in the next. But when the next war came ranges had become longer still, and fronts still more extended. The solution of the difficulty was as far off as ever. The introduction of smokeless powder brought with it additional complications. It became obvious that whoever could solve this great problem of co-operation would have an immense advantage against an adversary who had not succeeded in doing so, an advantage so enormous that victory would in all probability accompany it. Hence the feverish quest for unailing systems of co-operation which we see reflected in the military literature of to-day.

It was in the literature dealing with the events of the campaigns of 1866 and 1870-71 that the subject first took a prominent place.* But the difficulties of that day were as nothing to those of our own, and the methods which then appeared likely to yield a satisfactory solution of the problem would be of small assistance now. Other wars since that of 1870-71 have periodically revived interest in the question. Our late war in South Africa and the Manchurian campaign seem to have brought matters to a head.

But although the difficulties experienced in ensuring proper co-operation during both these campaigns were severe enough in comparison with those of previous operations, it is probable that in wars to come they may be more arduous still.

The circumstances of attack in these days of long ranging, rapid-firing, flat-trajectory rifles compel the assailant to expose himself to a much greater extent than the defender. The depth of the fire-swept zone condemns him to undergo this exposure for a much longer time than was formerly the case. If the attacking infantry is to reach decisive ranges in a condition for further effort, and finally to close with its antagonist in the spirit of confidence and determination which is essential for a successful issue, it must be spared all avoidable loss during the advance.

* See especially "Letters on Artillery," "Letters on Infantry"—by Prince Kraft zu Hohenlohe Ingelfingen. Translated by Colonel Walford. Published by the Royal Artillery Institution, 1887.

PART II.

Recent tactical developments and the influence they exert on modern operations, and especially in the course of the attack.

As a preliminary to considering how support can best be given by artillery to an infantry attack, it is essential to appreciate the conditions under which this attack will be made. It will therefore be convenient in the first place to notice the tendencies exhibited by some of the more recent tactical developments, and next to sketch briefly the influence which these exert on the conduct and progress of an attack.

Among modern tactical developments may be mentioned the following:—

Increased use of cover.—This, the natural result of improved firearms, was exemplified in South Africa and Manchuria, and although the extent to which cover was used in the latter campaign may have been partly due to abnormal circumstances. There can be no kind of doubt that the long ranges and flat trajectories of the present day will necessitate recourse to cover, natural and artificial, by both sides, and by both the arms with which we are dealing, in a greater or less degree throughout the action. It is the defender, however, who will have the better opportunity for the construction of cover, and, so far as infantry is concerned, the more to gain by doing so.

Difficulty of reconnaissance.—This is due to the long effective ranges and rapid fire of modern weapons, to the use of cover, and to the adoption of smokeless powder. The collective result of these is to render it possible to inflict loss on an advancing opponent without affording him more than the barest indication of the direction from which he is being engaged, and of the strength of the force opposed to him.

The increased difficulty of the advance during the later stages of an attack.—The flatter trajectories and more rapid fire of the present day have deepened the danger zone and rendered the volume of fire more dense, whether of musketry or shrapnel. The result is that an advance within defensive ranges against an entrenched defender is an operation too costly to be undertaken except as a forlorn hope, and is condemned almost intuitively to failure. It is generally recognized that a successful assault will be impossible unless the attacking fire-volley has had a revised third element.*

The efficacy of enfilade fire.—Long ranges and flat trajectories have made enfilade fire more deadly. Small bodies which are used in establishing themselves on the flanks of an opponent's position may often produce an effect out of all proportion to their strength.

* It is essential to the plan of the attack that the attacking force should be able to pass the danger zone. Preparation and execution of the attack are discussed in the *Report of the Committee on the Defence of the British Empire*, 1907.

This was one of the most noticeable lessons of the Manchurian Campaign. The Russians, stubborn fighters though they proved themselves, repeatedly fell back when threatened by the fire of inferior numbers from a flank.

The prevalence of enveloping attacks.—Mainly as a result of the great difficulty attending the frontal attack, and of the efficacy of enfilade fire, enveloping attacks now find great favour with tacticians of all nations. They were constantly practised by the Japanese in the late war, and the thoroughness with which they were executed was most marked. At the same time that envelopment was in progress, a steady pressure was maintained along the front, and by this means the reinforcement of the threatened flanks was made impossible. But unless numbers favour the attack the accomplishment of such an operation is attended with great risk, since, in order to give the necessary extension to the attack, depth must be sacrificed in some parts of the field. Consequently an active defender, if skilful enough to divine the dispositions of his opponent, is provided with an opportunity for counter-attack which he is unlikely to neglect.

Long duration of battles.—There is less unanimity on this point than exists in the case of most of the foregoing.* Without going so far as to assert that the duration of battles will in all cases be prolonged to the extent to which it was in the Russo-Japanese War, it cannot be doubted that the increased use of cover, the length of effective ranges, the difficulties of reconnaissance, and the holding power of the magazine rifle, will exert a strong influence in this direction in all important engagements.

The frequency of night operations.—The conditions which have been alluded to in the foregoing paragraphs tend to make movement on the battle field by day difficult, or even impossible. Advance or change of position will, therefore, often have to be deferred till nightfall, and collisions, accidental or intentional (as in the case of a night assault) may be expected to occur not infrequently in darkness. This has been fully exemplified in the most recent campaign.

The influence exerted by modern conditions of war on the course of the attack.—It is in the highest degree undesirable to allow ourselves to imagine an attack as conforming invariably to a particular model. To do so is not only to violate the principles of our training manuals which refuse to countenance any stereotyped form of attack,† but also to disregard the dictates of common sense. Variations in ground alone are sufficient to prevent any two instances from presenting exactly similar conditions, without taking into account the numerous other factors whose value varies in a corresponding degree. Besides ground, numbers, moral, weather, composition of forces, personal attributes of commanders, and a hundred other uncertain factors, combine to produce a given situation. In no two instances are all these factors the

* See particularly "Operations of War," Hamley. 1907 edition, revised by Kiggell.

† See "Infantry Training," Section 124.

same, and consequently in no two situations in war are the circumstances exactly similar. Nevertheless there are general characteristics which will find expression in almost every attack and enable us to recognize in each the recurrence of certain phases. These phases may for convenience be referred to under the heads which follow:—

- (a) *The reconnaissance.*—As soon as contact is established by the advanced troops the first aim of the attack will be to discover the dispositions of the adversary—what localities he holds and in what strength, the extent of his main position, and of any detached posts. To effect this a steady pressure will be exerted against the defenders' position, and effort will be made to force him to disclose his dispositions, while the attacker at the same time will avoid, if possible, committing himself to a particular course of action. Minor attacks, however, on particular points may have to be undertaken, each of which will present characteristics similar to those exhibited in the attack at large. From an appreciation of the situation as revealed to him by the intelligence obtained during the reconnoitring stage, the commander of the attacking force must judge what plans to adopt for the advance on the main position.
- (b) *The advance to decisive range.*—The main object of the attacker during this stage is the building up of a strong firing line within decisive range of that part of the defenders' position at which it is intended ultimately to drive the attack home. Other operations concurrently undertaken, such as holding attacks against other parts of the position with the design of deceiving the enemy and of immobilizing troops which he might devote to the reinforcement of the main point of attack, are merely subsidiary to the establishment of fire superiority over the defenders occupying that portion of the position against which the supreme effort is to be made.
- (c) *The establishment of superiority of fire.*—It is to this end that the previous operations will have been directed. To obtain a sufficient volume of fire a dense firing line at decisive range will be a necessity. In order that this dense line may not suffer such loss as will render it incapable of further advance it must be supported and protected by every means possible.
- (d) *The assault.*—This, the culminating operation of the attack, is, as has been already pointed out, merely the realization of a victory previously obtained by fire. It cannot succeed against a defender whose opposition has not been subdued by fire while at the same time

fire alone, though it may induce indifferent troops to evacuate a position, will not suffice to rout those imbued with the determination of the true soldier.

- (c) *The occupation of the position.*—This will be undertaken immediately the assault is successful to safeguard the advantage won. Rapidity may be essential in its execution since the confusion necessarily resulting from an assault renders the victor especially vulnerable to counter-attack by fresh troops.

In the foregoing observations the endeavour has been made to confine attention to those points which are common to the subject of attack in general. For this reason counter-attack has not been specifically referred to. But it must be clearly recognized that no defender who looks forward to ultimate success will confine himself, either locally or in large operations, to a passive defence. He may assume a defensive attitude with the view of launching a counter-attack on a certain predetermined plan, and to this end he may so shape his dispositions as either to create the opportunity he desires, or to force the enemy, by committing himself to a certain line of attack, to create it for him. Or he may retain a reserve in hand for the purpose, with the intention of applying it whenever and wherever an opening occurs. But whatever course he adopts, the operations devolve into attack on the one side and defence on the other, the positions possibly being reversed in different parts of the field. This being the case it appears that the preceding general observations on the attack are applicable to all such situations. Reference to co-operation in counter-attack will be made later.

The views expressed, and conclusions arrived at, in this part are in the main an abridgment of those contained in official publications and others which have received either official sanction or the support of general opinion*.

PART III.

Present systems of artillery training and recent improvements in material.

The thesis of the essay directs that the subject is to be treated with reference to "the present system of artillery training and to

* Among others the following have been drawn upon. Arguments and deductions will be found set forth in them at greater length :—

"Combined Training," 1906 (as amended).

"Infantry Training," 1905 (as amended).

"Field Artillery Training," 1906 (as amended).

"Operations of War"—Hamley—1907. Revised by Kiggell.

"Tactics of the Three Arms," Henderson (Science of War).

Essays for the Duncan Medal, 1907. Journal of Royal Artillery Institution, July, 1907.

"Notes upon Company and Battalion Tactics, and the employment of Artillery in Battle," Degtyarev. Journal of the R. U. S. I. January, 1908.

"Tendances francaises et allemandes relatives à la préparation et à l'exécution de la bataille." Revue Militaire Générale. January, 1907.

Narratives of Operations in Manchuria.

Von Lobel's year book for 1906.

German Regulations for Artillery.

recent improvements in material." It is, therefore, desirable to consider briefly what these are before proceeding to definite suggestions for the action of the artillery.

Present systems of artillery training

The salient features of present systems are:—

- (1) The practice of conducting fire from concealed positions by indirect laying.
- (2) The system of ranging with time shrapnel.
- (3) The system of searching or of searching and sweeping fire, i.e., the bombardment of a certain area by means of very rapid fire distributed over it.

(1) Fire from concealed positions.—The advantages of this system are that it secures immunity from severe losses and enables guns to remain unobserved either in a position of readiness to open fire, or in action.

Its disadvantage is that on the whole it diminishes effect. The time occupied in opening fire, or in changing the objective, is usually greater than when direct laying is employed; moving targets are less easily engaged; and unless a convenient observing station for the battery commander is available in proximity to the battery, communications are introduced in the shape of visual or telephonic communications, which are liable to lead to breakdowns or misunderstandings. Moreover, such positions imply the existence of dead ground in front of the guns. This disadvantage, however, is of relatively less importance in the attack.

(2) Ranging with time shrapnel. This has the advantage of making an effective fire possible from the first an important matter in the case of floating targets.

The disadvantages are that an exact knowledge of the angular difference in level between gun and target, and the angle of sight, is required, and that laying, and setting of fuses, must be most accurate to obtain satisfactory results.

(3) Searching, or searching and sweeping fire.—This system aims at making it possible to destroy even an enemy whose exact whereabouts are unknown, provided that he can be located within moderate limits, say within a depth of at least 400 yards from a visible feature on which ranging can be carried out. But there is a great expenditure of ammunition and a rather poor result.

Recent improvements in material

The most noticeable of these are:—

- (1) A quick-firing design of carriage for field guns and howitzers, itself the enemy of recoil and provided with an independent line of sight and ranging mechanism, with a quick-firing gun, a very high rate of fire, some 15 rounds a minute, to be maintained for some ten minutes.

- (ii) Shields, conferring on the detachment protection against frontal fire, except that with a steep angle of descent.
- (iii) Indirect laying apparatus—dial sights, directors, plotters, etc., which allow fire to be directed from under cover at objects unseen from the gun.
- (iv) Telephone equipments, easily carried and rapidly laid out, which facilitate communication between units of artillery and the higher commanders, or between artillery and infantry, and enable a battery commander to exercise command of his battery from a distant observing post, or to receive reports on the effect of his fire from the latter.
- (v) An improved design of field howitzer firing effective shrapnel from a great range with a steep angle of descent.
- (vi) Heavy mobile guns with great range and shell power.
- (vii) Quick-firing equipments for mountain artillery on the same lines as those for field artillery.

PART IV.

Measures to be taken for the support of infantry by artillery—

- (a) *in peace,*
- (b) *immediately before or during the different phases of an action.*

Having cleared the ground by an appreciation of the main characteristics of the infantry attack, of present systems of artillery training, and of recent changes in artillery material, we are now in a position to discuss in detail the manner in which the infantry attack is to be supported by artillery, and to put forward definite proposals.

In the first place it seems that the measures to be taken for ensuring effective support of the infantry may be divided into two classes, *viz.*,—

- (i) Measures to be taken during peace.
- (ii) Measures to be taken in or immediately before action.
- (i) Measures to be taken in peace.

We read in Combined Training, Section 110, that "The effective combination of the three arms depends to a great extent on the knowledge possessed by all leaders of the means by which the powers of their weapons can be best employed for the object in view."

This passage clearly implies that knowledge of this kind must be acquired before action. The greatest aid to this knowledge is a thorough mutual understanding between the two arms with which we are at present concerned. Such an understanding can be implanted and developed in peace. An artillery officer should be able to interpret all the signs offered by movements of infantry in the attack as seen from his position with the guns. From

the occurrences actually observed he should be able to divine others which are outside his vision. For instance, a sudden advance of supports some distance in his front, the forward movement of ammunition carts or mules, and perhaps a louder rattle of musketry should at once suggest to him that the firing line in that vicinity is probably being hardly pressed. He should be able to form a fairly accurate idea of the situation of the firing line which may, like a trench, enough, be hidden from him by some feature of the ground. This may help him to locate the causes of pressure—perhaps a hostile battery which has just opened fire, or a local counter attack which has been unexpectedly encountered and to come to the aid of the infantry.

An infantry officer should know whether this or that line of advance will mask the fire of the guns supporting him and be able to appreciate the advantage he will gain by directing his approach, say, up a certain steep slope which will enable fire to be continued by the artillery up to the moment of contact, in preference to adopting a line of advance which may be more direct and across easier ground, but which will bring his men, while still at a distance from their opponent, into danger from the fire of their own artillery and so necessitate an earlier cessation of the latter's fire.

It is believed that intuitive understanding by each arm of the conditions affecting the other at different phases of the battle can only be acquired by the officers of each actually serving with the other, and actually encountering, at all events in peace manoeuvres, the difficulties by which it is faced.

It is, therefore, proposed that it should be looked upon as part of the ordinary education of an officer of the artillery or infantry to be attached for a training season to the sister arm, and that no subaltern should, as a rule, be regarded as eligible for promotion to Captain who has not undergone this experience. It is believed that any inconvenience which might be caused by the withdrawal of an officer for a time from his own unit would be amply compensated for by the increased familiarity which each arm would gain with the other's methods and by the introduction of closer relations, social as well as professional.

In most cases no expense need be incurred in carrying out such a measure. Only in the infrequent cases where an officer happened to serve for a long period at stations not occupied by both arms would some expenditure in travelling have to be incurred.

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* The Japanese used both these devices on the Sha-ho. See "The Russo-Japanese War." De Castres de Ternac. Translation in *Journal of the Royal Artillery*, 1907.

from which it is not certain that it can afterwards be withdrawn should the development of the action show that other positions will afford it better opportunities for effectively supporting the infantry. These considerations point to the employment of long ranges and concealed positions in the early stage with which we are now dealing, and perhaps at the commencement of it to the retention of a part of the artillery in reserve. Since opportunities for the use of artillery will only occur by degrees as the action progresses, it is obvious that the initial operation orders cannot contain detailed instructions for the employment of the whole of the artillery. It will be advisable for the general officer commanding to content himself with disposing of only such a strength of artillery as he considers essential to the commencement of his undertaking. For the proper use of the remainder as opportunities arise he must rely on the commander of his artillery, who must be completely in his confidence, or he must himself take steps to this end as the necessity occurs. In either case it will be desirable for the commander of the artillery to be placed where he is in close touch with the general officer commanding, can keep the development of the fight under observation, and can maintain communication with the units of his command. The extent to which these requirements can be met will depend on the width of front covered, the circumstances of the combat, and the topographical peculiarities of the country. It is possible that circumstances may necessitate the division of the force into separate commands, each provided with its own artillery and acting more or less independently, and each or some of them too small to afford an excuse for the appointment of an artillery commander supernumerary to the establishment of units. In such a case the procedure in each force should follow that outlined above as far as the conditions under which it is acting allow.

It may be that in certain prescribed localities determined opposition may be met with even at this stage of the battle, perhaps to the extent of necessitating an actual assault to dislodge the defenders. Such a contingency is unlikely, since the attacking forces on either flank of the obstruction will by their advance so menace the necessarily rather limited area of resistance as to enforce a withdrawal in time to avoid the envelopment which would otherwise follow. Where, however, stubborn resistance of this nature is met with the general features of the conflict will be those of the main action in miniature, and the measures to be taken will be the same as those hereafter described, though on a smaller scale.

Gradually this phase of the action will merge into the next, to which we will now pass.

(b) The advance to decisive range.

As the preceding phase progresses and further information is obtained, it will ultimately become possible for the commander who is acting on the offensive to form a plan for the attack on the main position. An essential to the success of this plan will be the estab-

lishment of superiority of fire at the point where it is intended to drive the attack home, and for this purpose both infantry and artillery must move forward to decisive ranges. This advance may take the form of that "methodical progression from point to point," that "series of distinct engagement"* to which reference is made in Combined Training.†

It is during this phase that the support of artillery will become of increasing importance to infantry. As the firing line draws nearer the hostile position, its difficulties will become more serious, and losses more frequent. It is the business of the artillery to minimize these; to stand by its comrades of the infantry at every turn; to watch over them and to sacrifice itself if need be in pursuance of its resolution to protect them. The long ranges which were advantageous in the reconnoitring phase will now be out of place. It will be necessary to advance to those at which the full effect of the arm can be attained. The ease or the reverse, with which this advance can be effected will be a measure of the skill which has been brought to bear on the selection of the earlier positions. If these have been chosen so as to allow of an easy change of position by covered routes the support of the infantry as the troubles of the latter increase will be more prompt and less difficult than if guns have been located in positions which they cannot leave without coming under severe hostile fire. It is better, therefore, to be content in the early stages with only moderate protection when in action, provided freedom of movement is secured.

It must be borne in mind that while it is possible to wipe out artillery in movement in the open by inflicting loss on the teams, and so destroying its power of movement, a shielded battery moderately well entrenched need not fear being permanently silenced by the most furious *rafale*. A temporary cessation of fire may be necessitated; officers and men may have to go to ground like rabbits; serious loss may even be suffered; but when the storm is over the battery is still "in being." Losses are quickly made good from the wagon line, the teams are intact, and the power of the unit is as great as ever.

In unfavourable circumstances advance by daylight may be too risky. Darkness must then be relied on to provide that protection which the ground denies. But in such a case there is a danger that delay may frustrate the timely development of the action, perhaps with fatal results.

There is a matter in connection with this advance of the artillery which has often given rise to discussion, and which touches very nearly the problem of effective support of the infantry, *viz.*, the question of who is to be responsible for ordering an advance. Should the officer commanding the troops do so, or the officer

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Initiative of this sort should be encouraged by every possible means. It is better that a battery or two should be destroyed in the honest endeavour to play up to the infantry than that all the subordinate artillery commanders should hang back, perhaps with disastrous results, from the fear of incurring censure.

But even when this difficulty is thoroughly understood and responsibility accepted there will remain, for all commanders, the difficulty of keeping in such constant touch with events in their front as will enable them to form a sound judgment regarding the course to be pursued. This difficulty will be felt not only as regards deciding the most opportune instant for an advance, but also in other respects; for example, as to the objective which previous to the actual assault, it may be most important to engage at any moment.

For these purposes it is particularly desirable to maintain communication, as continuous and direct as possible, between artillery and the firing line. The scheme of communication in action is at the present time in a state of flux, and that part of it which relates to the matter in hand is particularly subject to controversy. There are extremists on both sides, those on the one hand who advocate direct communication from the actual firing line to brigades and batteries; on the other hand those who maintain that such communication must follow the ordinary channel of command, and proceed *via* battalion commanders and brigadiers to the commander of the division, descending again from him through the divisional artillery commander to the commanders of brigades and batteries. On the one hand we are confronted by the Scylla of complication and on the other by the Charybdis of delay. Probably the middle course is the safest. If it is possible to connect each commander of a battalion in the firing line with one of a few central artillery stations, the number of the latter being regulated according to the number of groups into which the artillery is distributed, and if it is possible to arrange that the nature of this connection shall allow of rapid and accurate transmission of inform-

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This point, however, is not perhaps of first rate importance provided the two sets of operators are thoroughly accustomed to working together.

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This phase will be entered on gradually. By degrees, as, during the advance, ranges get shorter and shorter, the effect of fire on either side will have more and more influence. Finally, at decisive ranges it will become all important. It is at this stage that the issue of the battle is practically decided. To assault before superiority of fire has been obtained is to invite disaster. After it has been obtained the assault is undertaken merely to put to flight an enemy already subdued (see Part II).

Every effort, therefore, must be concentrated on the attempt to overpower the enemy with fire. As regards the infantry, the firing line will be thickened to the greatest density which will allow to each man the free use of his weapon; reserves remaining in hand will be utilized as far as circumstances permit to support by fire their comrades in the firing line.

The artillery must be prepared to make any sacrifice which will help towards keeping down the defender's fire and put heart into the harassed infantry. To encourage the latter it may be necessary to advance still nearer to the defender's position, and to incur in doing so, and in taking up new positions, risks which at an earlier stage would be unwarrantable.

We must now consider what general principles should govern the disposition of the different natures of artillery in order that the closest support may be afforded at a cost not too great in proportion to the end in view.

There will ordinarily be available three, perhaps four, types of artillery, *viz.*,

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Field artillery (howitzers).

Heavy artillery (guns).

Mountain artillery (or to give it a more suitable name, pack artillery) which will include guns, and may in the future include howitzers.

Each of these types has its proper and most economical rôle in the fire fight.

The fire of field guns derives its power from its rapidity and volume and from the deep effective zone of its shrapnel. These guns can smother trenches with a hail of bullets so as to promise certain death to a defender who dares to raise his head above the parapet. Their very noise is encouraging to friends and intimidating to foes. But they cannot with frontal fire inflict much actual loss on a defender well posted behind cover, or on opposing shielded artillery. These qualities point to their employment at this stage to bring a rapid and concentrated fire to bear from comparatively short ranges on the locality selected for assault. They must also be on the watch for any attempt to re-inforce the threatened area, or to deliver a counterstroke, and must attempt to frustrate it. To aid in these aims the communication between infantry and artillery must be made full use of. The infantry must send back complete intelligence of events, and the artillery must be prepared to act promptly on information received. It should be the exception for field guns at this stage to engage the hostile shielded artillery unless the latter is making considerable impression on the attacking infantry and is open to engagement with oblique fire. It should be left, as a rule, to the other types of the attacking artillery to deal with their opponent's artillery as mentioned later.

Pack artillery, when present, can often, especially in broken country, be utilized for the closest support of infantry with greater ease than field artillery. Its method of transport and formations give it the power to take advantage of slight accidents of ground, and the loss of even a large number of transport animals does not immobilize it to the same extent that it does field artillery. It can, therefore, be handled with great daring, and perhaps be pushed forward, as it sometimes was by the Japanese in favourable ground in Manchuria, even into the firing line itself, where its moral support will be of great value. Its objective should almost invariably be the hostile infantry. It has neither the range nor the weight of metal, to engage in a contest with opposing field artillery. Where, however, as may happen in mountainous country, it forms the bulk or the whole of the artillery of a force, its employment must be influenced in a great degree by the principles which govern the action of field artillery.

Heavy artillery is distinguished by its great range and the exceptional power of its shell. This length of range confers upon it the ability to engage shielded field artillery with oblique fire without

entering the zone within which it would be liable to be overwhelmed by rapid fire in return. Its powerful shrapnel should be most efficacious against gun detachments in such circumstances, and it is probable that the bullets would occasionally even penetrate shields, if the thickness of the latter has been regulated solely with a view to protection from the fire of ordinary field guns. These advantages point to the principal function of heavy artillery being the attack of the hostile field batteries. The proportion of heavy artillery which is likely to be found with our armies in the immediate future is not sufficiently great to warrant us in relying on it solely for this purpose. It is perhaps, however, worthy of consideration whether an increase in this proportion is not desirable, with a view to setting free the field guns to devote themselves entirely to the opponents' infantry. In addition to engaging artillery heavy guns can render most useful service with oblique or enfilade fire against trenches which cannot be attacked in this way by field guns without placing the latter in a position too forward for safety. Here again their heavy shrapnel with its deep zone of effect will be of great value. The common shell of heavy artillery will have considerable effect against buildings, or cover of a more permanent nature than ordinary field entrenchments afford, and by dislodging the defender when under protection of this nature the friendly infantry may often be saved from otherwise unavoidable loss. Heavy artillery having so varied a sphere of usefulness, and existing in such small numbers must be disposed most carefully at this stage. Its limited mobility prohibits rapid changes of position, and makes it particularly vulnerable in motion. Probably so long as its establishment remains at the present figure the division of the battery into independent sections will generally be a necessity in order to secure its assistance at different points.

The characteristics of modern field howitzers are a moderately long range, longer than field guns, a moderately heavy shell, both common and shrapnel, and steep angles of descent. They can, therefore, also be usefully employed in opposition to shielded artillery, or in the attack of buildings or head cover. They are effective beyond every other gun in the frontal attack of vertical cover, and they can search out supports and reserves. This gives them great value in the later stages of the attack, when they can diminish the protection afforded by the defenders' trenches, and interfere with attempts to re-inforce the troops covered by these. But their most important rôle is enacted later and will be referred to under the heading of the assault. It is essential that during the latter part of fire fight, at latest, they shall be brought into occupation of positions from which they can command that portion of the enemy's position which is to form the objective of the decisive attack.

(d) The assault.

This phase of the battle, unlike those with which we have been dealing up to now, is sharply defined and of short duration. There

can be no lingering over the assault. It is launched, succeeds and is over, or is rolled back and dies away. In the latter case it may be repeated, but it is then a new assault, not a continuance of the first, and is probably attempted by fresh troops after a fresh fire struggle. From the moment that the assaulting infantry rise up from their cover to rush in until they top the defenders' parapets they are powerless for offence, and at the mercy of their opponents' guns and rifles, a dense and easy target in the open. Little wonder that even the superb infantry of Japan, utterly fearless of death as they were, failed over and over again in the assault when indifferently supported by their artillery. It is on the artillery, aided, perhaps, to some small extent by the fire of the reserves, if any remain, that devolves the task of holding in check the defenders' fire while the advance to the assault is being made. This fire must, as has been said already, have been subdued before an assault can be attempted, but it will be of no avail to have subdued it unless it can be kept in subjection. The most rapid fire possible from every gun that can bear must be directed on the locality to be assaulted, and kept up till the latest moment.

Two things are essential in order that artillery support may be timely and complete. Firstly, the artillery must know when the assault is going to take place a short time before the advance actually commences, or at the latest as soon as it does so in order that it may pour in the most deadly and concentrated fire possible on its foes. Secondly, it must know when the assaulting troops reach the defended position, or its close proximity, in order that it may spare its friends. The satisfaction of these two essential requirements involves problems as difficult as any which the attack presents.

The moment for launching the assault can be judged in the firing line alone; hence from the firing line alone can come any warning that it is imminent. It may even happen that the assault is spontaneously initiated, and that men are impelled to rush in by the example of their neighbours, and the desire to close and have done with it. In this case no warning to the artillery is possible, and the best that can be done is to give them early news of what is taking place. Both situations appear to demand that direct communication between firing line and artillery which has already been advocated in dealing with the earlier stages of the advance. The more the circumstances are considered, and the more vividly the course of events is pictured to the mind, the more one is impelled to the conclusion that nothing short of this direct communication will be of avail at such a critical moment, and with such a fleeting opportunity. As soon as intelligence reaches the artillery no time must be lost in directing the most rapid fire possible from every gun on to the point of assault.

The first difficulty overcome, there still remains the second; at what moment is this fire to cease? and how is the artillery to recognize when this moment has arrived? This is in fact a double problem. To solve it there is required in the first place a definite pronounce-

ment on the part of the infantry as to how far they are content to risk loss from their own artillery in return for protection afforded from the fire of the enemy. The limit between attacking infantry and the target of the field guns which our training manuals at present lay down as the safe distance on the level, *viz.*, 600 yards, would rob the assault of all support by guns from the very outset. But if it is to be reduced the demand for reduction must come from the infantry, and must be made with no uncertain voice. It is time to face this question, and to face it seriously. We know what the Japanese view is, and it is grounded on bloody experience. Their infantry officers have told us over and over again, that rather than forego artillery support they are content to incur the risk of even serious casualties from its fire. But our artillery want to know rather more than this, they want to know whether their own infantry agree. The question should be answered without delay.

When the advance to the assault takes place up a moderately steep slope the problem becomes less difficult. The infantry will be at a safe distance below the trajectory of shells directed on the defenders' position until they are close upon it, and it will be much easier for the artillery to judge by visual observation the space separating the assaulting troops from the trenches at any moment, and to regulate their fire accordingly. Similar advantages will be gained in cases where very oblique or enfilade fire can be brought to bear by the artillery on the trenches. The corollary to these propositions is that it may often be advantageous for the sake of ensuring full artillery support to the last to select as the point of assault, when possible, a portion of the position which provides ground of this kind.

But whatever the guns may do there can be no question about the howitzers. Their steep angle of descent will now exhibit its full value. Their fire can and must be continued till the assaulting infantry is mounting the parapets, and any nervous interference by generals, fearful for the safety of their infantry (an occurrence not outside our past experience), must be sternly discountenanced.

Lastly, we must consider how the artillery is to be made aware of the moment for cessation of fire on the defender's trenches. The telephone station which has accompanied the firing line up to the moment of the assault will probably be left some distance behind in the last rush forward, but even so its personnel will be in a more favourable position to judge of the proximity of the infantry to the trenches than will be the artillery much farther in rear. Careful arrangements must be made for communicating instantly to each battery the intelligence thus received, and for acting on it. Probably it will be necessary to adopt some recognized signal, such as the exhibition of a red flag at the rearward telephone station to signify that the assaulting line is within 200 yards (say) of its objective. Another device is one that was largely used by the Japanese, and has been tried in peace and favourably reported on by our own army at home—*viz.*, the carrying by the infantry of a number of small

flags of a conspicuous colour, which can be exposed so as to be visible to friends in rear and attract attention to the position of troops who, clothed in the neutral tinted fighting kit of the present day, might otherwise escape observation. But neither of these aids can remove the necessity for the possession by battery and brigade commanders of keen eyesight and a good glass; and if there be added self-reliance and the habit of quick thought and action on the part of these officers, there is reason to hope that all that is humanly possible to ensure support to the last moment will be done.

The necessity for the diversion of fire from the first line of the defence will of course not imply cessation of fire. Every gun must be turned on the ground in rear of the trenches, in order to inflict loss on any reinforcements which the enemy may attempt to bring up, or to harass his retirement.

(c) *The occupation of the position.*

If the assault fails, the artillery must redouble its fire on the trenches to save the infantry from disaster, and be especially on the watch to deal early with any attempt at counter-attack.

If the assault succeeds artillery must be moved quickly forward, by groups, to help in securing the ground that has been won, or to assist in the pursuit, if pursuit is practicable. The principles which have already been alluded to as governing the responsibility for ordering an advance in the earlier stages of the battle will apply equally in this phase.

Further operations will be a repetition of those which have gone before, except that so long as the demoralization of the enemy continues (and the repulse from a position must occasion loss of *moral* in a greater or less degree) the action of all arms may be characterized by great boldness and effect must be the first consideration.

In the preceding pages of this part the duration of the engagement has been left out of the question. It is immaterial, as it does not affect the principles involved. The same characteristics will be apparent in the different phases of an action whether the latter lasts for a day, or for a week, or for longer.

PART V.

Observations on special operations.

It remains to notice certain special conditions which may necessitate modification of the measures suggested in the previous pages as applicable to the various phases of a battle.

Night operations.

The use of the artillery of a field army in night operations is a recent innovation. Previous to the Russo-Japanese war it received little consideration and few were found to recommend it. But in that campaign frequent use was made of artillery by night in support

of infantry in attack and defence. The reasons are not difficult to discover. Firstly, the opponents faced each other for long periods without material change of position, and consequently were enabled to become well acquainted with each other's dispositions, and to ascertain and record by day the range and bearing of points on which it might become necessary to direct fire by night. Secondly, indirect laying was employed for the first time, and this required apparatus not previously provided, which rendered laying by night perfectly feasible.

In Part II it has been contended that modern developments tend to lengthen the duration of battles, and to render night operations at times an absolute necessity. Consequently the causes which operated in Manchuria to compel the use of artillery by night in support of infantry may be expected to recur when we next take the field. Advances will have to be made by the infantry, and perhaps assaults undertaken by night.

- (a) In the case of an advance with no intention of closing with the enemy, but with the object of occupying ground from which the struggle can be continued by daylight to better advantage, it will generally be the aim of the attackers to elude observation by the defence. Consequently fire will not be opened by the artillery (except it be to distract attention from the real object in view) unless the movement is discovered. If it is discovered, fire should be brought to bear on that portion of the enemy's forces, be it artillery, or be it infantry, which at the time is causing the attacker's infantry most inconvenience. If searchlights are not employed by the defence it may be predicted with some confidence that his artillery will be the proper target, since in these circumstances his rifle fire will be inaccurate and may be neglected. If, however, the defence is using searchlights his rifle fire may be effective and the intelligence received by the artillery of the attack from its infantry will have to be relied on as a guide to the choice of the objective for the former.

If the chosen objective is one which has already been engaged by day, or of which the range and bearing is recorded, the difficulty of directing fire on it will not be very great.

But if this is not the case the difficulty will be considerable.

If searchlights are employed on the attacking side, and are under the control of the artillery, it is probable that some few guns might range on an objective at an unknown distance, but the number that could do so would be very limited unless the extent of target illuminated was very large, since observation of fire would be a matter of extreme difficulty with more than one battery in action. If searchlights are not available to the attack it would probably be practically impossible to engage such an

from which it is not certain that it can afterwards be withdrawn should the development of the action show that other positions would afford it better opportunities for effectively supporting the infantry. These considerations point to the employment of long ranges and concealed positions in the early stage with which we are now dealing, and perhaps at the commencement of it to the retention of a part of the artillery in reserve. Since opportunities for the use of artillery will only occur by degrees as the action progresses it is obvious that the initial operation orders cannot contain detailed instructions for the employment of the whole of the artillery. It will be advisable for the general officer commanding to content himself with disposing of only such a strength of artillery as he considers essential to the commencement of his undertaking. For the proper use of the remainder as opportunities arise he must rely on the commander of his artillery, who must be completely in his confidence, or he must himself take steps to this end as the necessity occurs. In either case it will be desirable for the commander of the artillery to be placed where he is in close touch with the general officer commanding, can keep the development of the fight under observation, and can maintain communication with the units of his command. The extent to which these requirements can be met will depend on the width of front covered, the circumstances of the combat, and the topographical peculiarities of the country. It is possible that circumstances may necessitate the division of the force into separate commands, each provided with its own artillery and acting more or less independently, and each, or some of them, too small to afford an excuse for the appointment of an artillery commander supernumerary to the establishment of units. In such a case the procedure in each force should follow that outlined above, as far as the conditions under which it is acting allow.

It may be that in certain prescribed localities determined opposition may be met with even at this stage of the battle, perhaps to the extent of necessitating an actual assault to dislodge the defenders. Such a contingency is unlikely, since the attacking forces on either flank of the obstruction will by their advance so menace the necessarily rather limited area of resistance as to enforce a withdrawal in time to avoid the envelopment which would otherwise follow. Where, however, stubborn resistance of this nature is met with the general features of the conflict will be those of the main action in miniature, and the measures to be taken will be the same as those hereafter described, though on a smaller scale.

Gradually this phase of the action will merge into the next to which we will now pass.

(b) The advance to decisive attack.

As the preceding phase progresses and further information is obtained it will ultimately become possible for the commander who is acting on the offensive to find a point for the attack on the main position. An essential to the success of this plan will be the estab-

lishment of superiority of fire at the point where it is intended to drive the attack home, and for this purpose both infantry and artillery must move forward to decisive ranges. This advance may take the form of that "methodical progression from point to point," that "series of distinct engagement"* to which reference is made in Combined Training.†

It is during this phase that the support of artillery will become of increasing importance to infantry. As the firing line draws nearer the hostile position, its difficulties will become more serious, and losses more frequent. It is the business of the artillery to minimize these; to stand by its comrades of the infantry at every turn; to watch over them and to sacrifice itself if need be in pursuance of its resolution to protect them. The long ranges which were advantageous in the reconnoitring phase will now be out of place. It will be necessary to advance to those at which the full effect of the arm can be attained. The ease or the reverse, with which this advance can be effected will be a measure of the skill which has been brought to bear on the selection of the earlier positions. If these have been chosen so as to allow of an easy change of position by covered routes the support of the infantry as the troubles of the latter increase will be more prompt and less difficult than if guns have been located in positions which they cannot leave without coming under severe hostile fire. It is better, therefore, to be content in the early stages with only moderate protection when in action, provided freedom of movement is secured.

It must be borne in mind that while it is possible to wipe out artillery in movement in the open by inflicting loss on the teams, and so destroying its power of movement, a shielded battery moderately well entrenched need not fear being permanently silenced by the most furious *rafale*. A temporary cessation of fire may be necessitated; officers and men may have to go to ground like rabbits; serious loss may even be suffered; but when the storm is over the battery is still "in being." Losses are quickly made good from the wagon line, the teams are intact, and the power of the unit is as great as ever.

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Pack artillery, when present, can often, especially in broken country, be utilized for the closest support of infantry with greater ease than field artillery. Its method of transport and formations give it the power to take advantage of slight accidents of ground, and the loss of even a large number of transport animals does not immobilize it to the same extent that it does field artillery. It can, therefore, be handled with great daring, and perhaps be pushed forward, as it sometimes was by the Japanese in favourable ground in Manchuria, even into the firing line itself, where its moral support will be of great value. Its objective should almost invariably be the hostile infantry. It has neither the range nor the weight of metal, to engage in a contest with opposing field artillery. Where, however, as may happen in mountainous country, it forms the bulk or the whole of the artillery of a force, its employment must be influenced in a great degree by the principles which govern the action of field artillery.

Heavy artillery is distinguished by its great range and the exceptional power of its shell. This length of range confers upon it the ability to engage shielded field artillery with oblique fire without

entering the zone within which it would be liable to be overwhelmed by rapid fire in return. Its powerful shrapnel should be most efficacious against gun detachments in such circumstances, and it is probable that the bullets would occasionally even penetrate shields, if the thickness of the latter has been regulated solely with a view to protection from the fire of ordinary field guns. These advantages point to the principal function of heavy artillery being the attack of the hostile field batteries. The proportion of heavy artillery which is likely to be found with our armies in the immediate future is not sufficiently great to warrant us in relying on it solely for this purpose. It is perhaps, however, worthy of consideration whether an increase in this proportion is not desirable, with a view to setting free the field guns to devote themselves entirely to the opponents' infantry. In addition to engaging artillery heavy guns can render most useful service with oblique or enfilade fire against trenches which cannot be attacked in this way by field guns without placing the latter in a position too forward for safety. Here again their heavy shrapnel with its deep zone of effect will be of great value. The common shell of heavy artillery will have considerable effect against buildings, or cover of a more permanent nature than ordinary field entrenchments afford, and by dislodging the defender when under protection of this nature the friendly infantry may often be saved from otherwise unavoidable loss. Heavy artillery having so varied a sphere of usefulness, and existing in such small numbers must be disposed most carefully at this stage. Its limited mobility prohibits rapid changes of position, and makes it particularly vulnerable in motion. Probably so long as its establishment remains at the present figure the division of the battery into independent sections will generally be a necessity in order to secure its assistance at different points.

The characteristics of modern field howitzers are a moderately long range, longer than field guns, a moderately heavy shell, both common and shrapnel, and steep angles of descent. They can, therefore, also be usefully employed in opposition to shielded artillery, or in the attack of buildings or head cover. They are effective beyond every other gun in the frontal attack of vertical cover, and they can search out supports and reserves. This gives them great value in the later stages of the attack, when they can diminish the protection afforded by the defenders' trenches, and interfere with attempts to re-inforce the troops covered by these. But their most important rôle is enacted later and will be referred to under the heading of the assault. It is essential that during the latter part of fire fight, at latest, they shall be brought into occupation of positions from which they can command that portion of the enemy's position which is to form the objective of the decisive attack.

(d) The assault.

This phase of the battle, unlike those with which we have been dealing up to now, is sharply defined and of short duration. There

can be no lingering over the assault. It is launched, succeeds and is over, or is rolled back and dies away. In the latter case it may be repeated, but it is then a new assault, not a continuance of the first, and is probably attempted by fresh troops after a fresh fire struggle. From the moment that the assaulting infantry rise up from their cover to rush in until they top the defenders' parapets they are powerless for offence, and at the mercy of their opponents' guns and rifles, a dense and easy target in the open. Little wonder that even the superb infantry of Japan, utterly fearless of death as they were, failed over and over again in the assault when indifferently supported by their artillery. It is on the artillery, aided, perhaps, to some small extent by the fire of the reserves, if any remain, that devolves the task of holding in check the defenders' fire while the advance to the assault is being made. This fire must, as has been said already, have been subdued before an assault can be attempted, but it will be of no avail to have subdued it unless it can be kept in subjection. The most rapid fire possible from every gun that can bear must be directed on the locality to be assaulted, and kept up till the latest moment.

Two things are essential in order that artillery support may be timely and complete. Firstly, the artillery must know when the assault is going to take place a short time before the advance actually commences, or at the latest as soon as it does so in order that it may pour in the most deadly and concentrated fire possible on its foes. Secondly, it must know when the assaulting troops reach the defended position, or its close proximity, in order that it may spare its friends. The satisfaction of these two essential requirements involves problems as difficult as any which the attack presents.

The moment for launching the assault can be judged in the firing line alone; hence from the firing line alone can come any warning that it is imminent. It may even happen that the assault is spontaneously initiated, and that men are impelled to rush in by the example of their neighbours, and the desire to close and have done with it. In this case no warning to the artillery is possible, and the best that can be done is to give them early news of what is taking place. Both situations appear to demand that direct communication between firing line and artillery which has already been advocated in dealing with the earlier stages of the advance. The more the circumstances are considered, and the more vividly the course of events is pictured to the mind, the more one is impelled to the conclusion that nothing short of this direct communication will be of avail at such a critical moment, and with such a fleeting opportunity. As soon as intelligence reaches the artillery no time must be lost in directing the most rapid fire possible from every gun on to the point of assault.

The first difficulty overcome, there still remains the second; at what moment is this fire to cease? and how is the artillery to recognize when this moment has arrived? This is in fact a double problem. To solve it there is required in the first place a definite pronounce-

ment on the part of the infantry as to how far they are content to risk loss from their own artillery in return for protection afforded from the fire of the enemy. The limit between attacking infantry and the target of the field guns which our training manuals at present lay down as the safe distance on the level, *viz.*, 600 yards, would rob the assault of all support by guns from the very outset. But if it is to be reduced the demand for reduction must come from the infantry, and must be made with no uncertain voice. It is time to face this question, and to face it seriously. We know what the Japanese view is, and it is grounded on bloody experience. Their infantry officers have told us over and over again, that rather than forego artillery support they are content to incur the risk of even serious casualties from its fire. But our artillery want to know rather more than this, they want to know whether their own infantry agree. The question should be answered without delay.

When the advance to the assault takes place up a moderately steep slope the problem becomes less difficult. The infantry will be at a safe distance below the trajectory of shells directed on the defenders' position until they are close upon it, and it will be much easier for the artillery to judge by visual observation the space separating the assaulting troops from the trenches at any moment, and to regulate their fire accordingly. Similar advantages will be gained in cases where very oblique or enfilade fire can be brought to bear by the artillery on the trenches. The corollary to these propositions is that it may often be advantageous for the sake of ensuring full artillery support to the last to select as the point of assault, when possible, a portion of the position which provides ground of this kind.

But whatever the guns may do there can be no question about the howitzers. Their steep angle of descent will now exhibit its full value. Their fire can and must be continued till the assaulting infantry is mounting the parapets, and any nervous interference by generals, fearful for the safety of their infantry (an occurrence not outside our past experience), must be sternly discountenanced.

Lastly, we must consider how the artillery is to be made aware of the moment for cessation of fire on the defender's trenches. The telephone station which has accompanied the firing line up to the moment of the assault will probably be left some distance behind in the last rush forward, but even so its personnel will be in a more favourable position to judge of the proximity of the infantry to the trenches than will be the artillery much farther in rear. Careful arrangements must be made for communicating instantly to each battery the intelligence thus received, and for acting on it. Probably it will be necessary to adopt some recognized signal, such as the exhibition of a red flag at the rearward telephone station to signify that the assaulting line is within 200 yards (say) of its objective. Another device is one that was largely used by the Japanese, and has been tried in peace and favourably reported on by our own army at home—*viz.*, the carrying by the infantry of a number of small

flags of a conspicuous colour, which can be exposed so as to be visible to friends in rear and attract attention to the position of troops who, clothed in the neutral tinted fighting kit of the present day, might otherwise escape observation. But neither of these aids can remove the necessity for the possession by battery and brigade commanders of keen eyesight and a good glass; and if there be added self-reliance and the habit of quick thought and action on the part of these officers, there is reason to hope that all that is humanly possible to ensure support to the last moment will be done.

The necessity for the diversion of fire from the first line of the defence will of course not imply cessation of fire. Every gun must be turned on the ground in rear of the trenches, in order to inflict loss on any reinforcements which the enemy may attempt to bring up, or to harass his retirement.

(e) The occupation of the position.

If the assault fails, the artillery must redouble its fire on the trenches to save the infantry from disaster, and be especially on the watch to deal early with any attempt at counter-attack.

If the assault succeeds artillery must be moved quickly forward, by groups, to help in securing the ground that has been won, or to assist in the pursuit, if pursuit is practicable. The principles which have already been alluded to as governing the responsibility for ordering an advance in the earlier stages of the battle will apply equally in this phase.

Further operations will be a repetition of those which have gone before, except that so long as the demoralization of the enemy continues (and the repulse from a position must occasion loss of *moral* in a greater or less degree) the action of all arms may be characterized by great boldness and effect must be the first consideration.

In the preceding pages of this part the duration of the engagement has been left out of the question. It is immaterial, as it does not affect the principles involved. The same characteristics will be apparent in the different phases of an action whether the latter lasts for a day, or for a week, or for longer.

PART V.

Observations on special operations.

It remains to notice certain special conditions which may necessitate modification of the measures suggested in the previous pages as applicable to the various phases of a battle.

Night operations.

The use of the artillery of a field army in night operations is a recent innovation. Previous to the Russo-Japanese war it received little consideration and few were found to recommend it. But in that campaign frequent use was made of artillery by night in support

of infantry in attack and defence. The reasons are not difficult to discover. Firstly, the opponents faced each other for long periods without material change of position, and consequently were enabled to become well acquainted with each other's dispositions, and to ascertain and record by day the range and bearing of points on which it might become necessary to direct fire by night. Secondly, indirect laying was employed for the first time, and this required apparatus not previously provided, which rendered laying by night perfectly feasible.

In Part II it has been contended that modern developments tend to lengthen the duration of battles, and to render night operations at times an absolute necessity. Consequently the causes which operated in Manchuria to compel the use of artillery by night in support of infantry may be expected to recur when we next take the field. Advances will have to be made by the infantry, and perhaps assaults undertaken by night.

(a) In the case of an advance with no intention of closing with the enemy, but with the object of occupying ground from which the struggle can be continued by daylight to better advantage, it will generally be the aim of the attackers to elude observation by the defence. Consequently fire will not be opened by the artillery (except it be to distract attention from the real object in view) unless the movement is discovered. If it is discovered, fire should be brought to bear on that portion of the enemy's forces, be it artillery, or be it infantry, which at the time is causing the attacker's infantry most inconvenience. If searchlights are not employed by the defence it may be predicted with some confidence that his artillery will be the proper target, since in these circumstances his rifle fire will be inaccurate and may be neglected. If, however, the defence is using searchlights his rifle fire may be effective and the intelligence received by the artillery of the attack from its infantry will have to be relied on as a guide to the choice of the objective for the former.

If the chosen objective is one which has already been engaged by day, or of which the range and bearing is recorded, the difficulty of directing fire on it will not be very great.

But if this is not the case the difficulty will be considerable. If searchlights are employed on the attacking side, and are under the control of the artillery, it is probable that some few guns might range on an objective at an unknown distance, but the number that could do so would be very limited unless the extent of target illuminated was very large, since observation of fire would be a matter of extreme difficulty with more than one battery in action. If searchlights are not available to the attack it would probably be practically impossible to engage such an

objective with any hope of effect. To do so would require the adoption of systems of observation of fire and of apparatus which are peculiar to siege artillery.

- (b) In the case of a night assault the problem is somewhat different. There can be no question in this case as to what is the best objective for the artillery of the attack. It will be, as by day, that portion of the defended position against which the assault is directed.

There will be no difficulty by night in making known to the artillery beforehand the exact time for launching the assault, and the range and direction of the objective should be well known, but the difficulty of determining the right moment for the artillery fire to cease will be very great, and, if searchlights are not employed, probably insurmountable for the guns, if not for the howitzers also. Hence it may be found that in this instance also the enemy's artillery offer the most practical target.

The whole question of the employment of artillery by night in such circumstances as those referred to at (a) and (b) above is a very thorny one. It is understood that some limited experiments have been undertaken in England, but no data are at present available on which to base deductions. The subject is one of considerable importance and careful investigation is urgently needed if we are to acquire experience in peace. If we do not, no doubt we shall obtain it in war, but the price to be paid for it will be higher.

Mountain Warfare.

In all matters of tactics ground has a predominating influence. In most campaigns the conformation of the ground is different in different battles. In large operations it frequently varies in different parts of the same battlefield. But in what we term mountain warfare the conformation of the ground is of an extreme type, and is more or less constant throughout the whole theatre of war. Consequently certain matters of organization require to be adapted to the particular campaign, and these and the ground itself exert on the operations a constant influence which is reflected in the tactics employed.

In mountain warfare difficulties of transport limit the weight of the artillery and the nature of the ground necessitates the division of the force into smaller independent bodies.

The spirit of the proposals already put forward for the action of supporting artillery will not be thereby affected, but the details of execution will.

The absence of the heavier guns, and perhaps the entire absence of field guns will forbid the use of long ranges. The distribution of the force will prevent central control of artillery. Consequently the action will develop more quickly and will be of shorter duration, and there will be more necessity for initiative, and for the

ready acceptance of responsibility by the commanders of brigades or batteries.

Where the enemy, as in hill campaigns on the Frontier, has no artillery the task of our own artillery is much simplified. It need have little doubt as to the most suitable target in attack, and it has much less anxiety for its own safety. Its action may, therefore, be characterized by considerable boldness. The closest support can be accorded to the infantry. There will be little or no difficulty when the assault takes place in recognizing the moment for changing the objective.

*Counter-attack.**

The operation of counter-attack requires a brief notice to itself, in that the conditions under which it is undertaken are in some ways distinct from those governing the attack proper.

Counter-attacks may be local or general.

A local counter-attack is hardly an attack in the sense in which the word has been used for the purpose of this paper. It forms no part of the main plan of the commander of the force, but is undertaken on the initiative of a subordinate commander in order to disconcert the attack on his particular section of the position, and to enable him to prolong his resistance. It will not be pushed beyond the point at which the safe retirement of the force making it would be prejudiced. Up to this point, however, it is carried with vigour. Inasmuch as a counter-attack unsupported by artillery is liable to be, and has often been, driven back by artillery alone, it must receive all the artillery support that can be spared to it, and the retirement of the troops who have made it must be covered in the same way.

A general counter-attack is a very different matter. It is an essential part of the plan of the commander of the force. It is intended to be pushed home and aims at securing victory for the side which undertakes it. But its development will not take place on the same lines as the attack proper. There will be no reconnoitring phase. The commander will have gained all possible information before beginning it. Surprise will be a feature of its commencement, and to take complete advantage of this surprise it must be pushed home with energy, and without giving time for recovery to the enemy. It must, therefore, receive the full and close support of the artillery from the first. The positions for the artillery must have been well thought out beforehand, and if possible occupied. But fire should not be opened from them till the moment arrives for launching the counter-attack, in order that they may remain undetected and, therefore, unmolested by the enemy. A successful counter-attack will consist of a quick progression from point to point, with no pause long enough to enable the opponent to rally. There may be a series of hand to hand conflicts, but, as a

* See "The Counter-Attack." Kiggel. Aldershot Military Society Lecture No. 85.

rule, there will be no regular assault, since there will be no defined position to assault. The artillery must attend carefully to every onward step of the infantry and must exert all its power to assist it. The means of communication with the firing line proposed for the attack proper will be equally necessary in the case of the counter-attack. If victory is achieved the artillery must act as in the occupation of a captured position and in the pursuit, as already described.

PART VI.

Summary.

The conclusions to which the discussion of the subject has led may be summarized as follows:—

- (1) The necessity for supporting infantry by the fire of artillery is not new, but the importance of support is greater and the obstacles to giving it have increased.
- (2) Recent tactical developments have altered the conditions under which the infantry attack will be made, and enhanced the difficulties of it.
- (3) New systems of training and recent improvements in material have conferred greater fire power on artillery.
- (4) The problem of support is how to utilize this great fire power to counterbalance the enhanced difficulties of the infantry.
- (5) The problem can only be solved by intimate co-operation between artillery and infantry.
- (6) Such co-operation demands instinctive knowledge on the part of each arm of the other's capabilities and limitations.
- (7) This instinctive knowledge can be fostered in peace by associating officers of each arm with the training of the other.
- (8) Successful co-operation also demands of the commander of a force an appreciation immediately before action of the plan which will give to each arm the fullest opportunities for combining its action with that of the other.
- (9) It demands supervision on the part of superior artillery commanders, but at the same time it requires ready initiative on the part of subordinate commanders, and scope to exercise it.
- (10) It implies the use of the different types of artillery each for the particular purpose for which it is best suited, and their distribution in the early stages of the action in such a manner as to facilitate the appropriate employment of each in the later stages.
- (11) It calls for prompt, direct and simple channels of communication between the artillery and the firing line, and the closest attention on the part of artillery com-

manders to the intelligence they receive by this means, and to the events in their front which are visible to them.

- (12) Most important of all, the infantry must make it clear that they are willing to submit to the risk of loss from their own artillery fire in the assault in return for the protection it will afford them, and the artillery must resolve to let no loss short of annihilation deter them from making this protection complete.

SEA TRANSPORT.

With Special Reference to the recent Campaign in South Africa.

*A Lecture delivered at the Town Hall, Simla, on Wednesday,
17th June 1908.*

BY BRIG.-GENERAL J. S. COWANS, M.V.O. *p.s.c.*

1. Brief history, object and organisation of the Naval Transport Department.
2. Q. M. G's Departments in its relationship to the Transport Department.
3. Relationship of War Office, India Office and Admiralty in regard to Indian Trooping Service and finance of the same.
4. Selection, fitting up and cost of ships for men, horses, stores and hospitals.
5. Procedure leading up to Embarkation of Units showing some of the difficulties at Ports attending the dual control.
6. Victualling and messing on boardship.
7. Ports in United Kingdom most suitable for Embarkation.
8. A few details as to numbers of men and horses embarked to South Africa—together with losses.
9. Railways in connection with Embarkation and Disembarkation in England.
10. Miscellaneous items—such as Deportation of Boer Prisoners—Undesirables—Discharged Colonials—Cattle-men, etc.

YOUR EXCELLENCY AND OFFICERS.—The remarks I am going to make concern more generally my experiences at the War Office during the Boer War; but many of them are of general applicability. An Indian scheme was also drawn up for the despatch of their contingent to Natal, and I am glad to say we have amongst us Colonel Triscott, who was the officer who embarked that contingent, and he has very kindly consented to say a few words on his experiences so far as Indian embarkations are concerned.

It is very difficult to compress into 45 minutes half of such a subject as Sea Transport, and I can only apologise if any details are omitted. There is no limit to the subsequent discussion, and I shall be glad to answer any questions at the conclusion of the lecture to the best of my ability.

Probably at no period in the history of our nation was there ever a more general knowledge of Sea Transport than existed at the close of the Boer War—amongst all ranks of the two services and

the mercantile marine—not to mention those officers, N.-C. O.'s and men who gained most practical experience through employment at places of embarkation and disembarkation from 1899 to 1904

The peculiar geographical conditions of our Empire demand at least a rudimentary knowledge of Sea Transport from all our officers, and more particularly staff officers—yet up to the last South African War military officers as a rule almost ignored it and considered that it more appertained to the Navy. It is owing to the prevalence of such ideas that naval officers to an increasing extent usurped our Army work at places of embarkation and disembarkation. No one can blame them, rather the reverse.

I propose giving you a very brief history of the Naval Transport Department as it is to a great extent on this that the Lords of the Admiralty base their arguments, which insist on *absolute* control of any movements of the Army by sea.

Now the Admiralty Transport Department (which I will throughout refer to as the Transport Department) is traceable for over 200 years, since in fact 1689, when the French invaded Ireland; and at that time it consisted of a Captain, Royal Navy, with an Assistant Surveyor and Purveyor from the Navy Office. In the reigns of Queen Anne and George I a separate Transport Department existed under the Admiralty from 1710—1724 and again a similar department existed from 1796 to 1817—in this latter period (embracing the period of the Peninsular War) the Transport service was conducted by a Board consisting of five Commissioners, a Secretary, Accountant, and a large staff of surveyors and clerks. This Board corresponded directly with each of the various Government departments and with the Agents and masters of Transports. Shortly after the close of the Peninsular War it was abolished and the business was transferred to the Navy Board, the duties of which were in 1830 merged in the Board of Admiralty.

From that period until February 1855 the business was mainly conducted by the Controller of Victualling and Transport services under the supervision and control of one of the Lords of the Admiralty.

When this country suddenly found itself at war with Russia in 1854 the pressure was so great and the more legitimate duties of the Superintending Lord so numerous, that the Transport Department was unable to carry out its duties satisfactorily. A Transport Board was accordingly established in February 1855 and continued in operation until the early part of 1857; after the Russian war it was brought to a termination. The Board consisted of a Naval Officer as Chairman, one Military Member and a Gentleman of Commerce from the Merchant service. Through the medium of its Chairman it was daily in direct and close communication with the Secretary of State for War and Lords Commissioners of the Admiralty to whom it was immediately responsible.

In 1857, the system which obtained prior to 1855 was re-adopted. In 1861 a select Committee was appointed to enquire into

the organisation and management of those branches of the Admiralty War Office, India Office and Emigration Board by which the business of transporting troops, convicts, etc., was performed.

The Committee recommended :—

- (1) The immediate separation of the Transport from the Victualling Department of the Admiralty.
- (2) The removal from the India Office of the Transport of all troops and stores to and from our East Indian possessions.
- (3) Abolition of the Emigration Office.

Simultaneously with these changes the Committee recommended the formation of a distinct and separate Transport Office on the principle of the Transport Board last referred to (*i.e.*, one containing a Military Member) properly organised and directly responsible to a department of the State, for transport of every kind required by the Government to any part of our coasts and to all our colonies and possessions (including India), and the Committee were finally of opinion that the new department should be placed under the sole control of the Lords Commissioners of the Admiralty. This would be practically an Imperial Transport Board.

In December 1861 when war with America appeared imminent the Admiralty themselves proposed the formation of a Transport Office with a Naval Captain as President, a Military Officer, and Secretary.

The Treasury, after assenting, withdrew their consent pending fuller consideration of the matter, but in 1862 a temporary Transport Board (with a Military Member from the Horse Guards) was established and this went on until 1888, though objected to by the Secretary of State for War as an unsatisfactory substitute for a properly constituted Board.

I may say that all the Military Member did was to go down to the Admiralty occasionally for an hour or so for which he received in addition to his pay £1 a day from 1862—1879 and 10s. a day from 1879—1888. The senior A. Q. M. G. had the benefit of this emolument, and as he dealt with barrack work in the War Office the arrangement was not of much practical value.

In 1888 the expenditure on Sea Transport was transferred from Naval to Army Votes and the Military Member of the Transport Department abolished.

In the same year, 1888, a Committee sat once again and practically the condition of affairs existing from 1862 was permitted to continue, which is—

- (1) That the Transport Department of the Admiralty provides Sea Transport for the army.
- (2) That the Director of Transports receives the annual programme of sea moves and stores and prepares the estimate for them.

The report of the Committee was forwarded in 1888 to the Admiralty and the Secretary of State suggested it was a suitable

time to form the Transport Board recommended (please note) in 1861.

Though a communication was promised it was not made till the Secretary of State again addressed the Admiralty in 1895 when the troopships were replaced by freight ships and hired transports. Nothing more however was done beyond it being arranged that an officer from Q. M. G.'s Office should be attached to the Admiralty *pro tem.* during war.

The Admiralty (as you see) therefore ignored the 1861 Committee recommendations and practically excluded the Military Member from the Transport Department, whilst altogether excluding the Civilian Shipping Member.

There can be no doubt whatever that the arrangement is not an altogether satisfactory one, so far as the War Office is concerned, but practically till a Transport Board is formed it is the best that can be done; the only alternative of course is to have a naval branch under Q. M. G. at the War Office and for them to run their own show which would not be satisfactory, besides it would never meet with Admiralty approval or help. I may add that we simply could not possibly, by ourselves at the War Office, have run the South African War transport, where we took up as many as 116 transports for troops, numerous store ships and a tremendous tonnage of freight in all parts of the world. Again, whilst the Director of Transports works under the Admiralty we have the great advantage of assistance all over the world from H. M.'s ships which we would never be allowed otherwise, and for such assistance we have much to thank the Navy for during the Boer War; for instance, in embarkations at Queenstown, fitting up ships at Portsmouth and Chatham, coaling *en route* to South Africa, help in case of disabled ships and shipwrecks, surveys of ships, etc., on the Australian and other stations by the senior Naval Officer, etc., etc.; in none of the above cases could we give directions so rapidly as the Admiralty did, as we should have to apply to them for assistance.

It is useless denying that there are undoubtedly strong and sound reasons why the whole of Sea Transport should be worked under the Admiralty, but the recommendations of the 1861 Committee, to my mind, should be carried out. So far as I can recollect, the Admiralty contend that the introduction of a military element on the Transport Board would impair the unity and directness of their control over the Transport service; and they state that it was for this reason that their original proposal to the Treasury in 1861 was never carried into effect; and that they strenuously resist any alteration in the present arrangements which are practically those instituted in 1862.

Now as to practice. In 1898 we had a little insight into how the arrangements would work out in consequence of the Egyptian war of that year. The fact became quite apparent that even in a small war, the Admiralty despatch of equipment and stores required considerable systematising; for we found as an instance in one case that fuzes of a howitzer battery embarking for Egypt were being despatched in a separate ship to the battery.

You naturally say, then, why in sending on your requisitions for stores, etc., didn't you state which was to be sent first and which embarked on top of the cargo so as to be accessible immediately on arrival?

Herein lies the pith of the whole question, for nearly all such requisitions were made by departments direct on the Admiralty and were not even seen by the Q. M. G. till any complaint arose; notwithstanding repeated protests from the Q. M. G. those departments, especially, Clothing, I. G. Fortifications, and Medical Departments resisted what they regarded as interference from the Q. M. G. which was likely to lead to delays, for Q. M. G. would be an extra channel.

I must admit that it was practically impossible for the Director of Transports without military advice to distinguish which requisition should be met first, and they could not do more than pass them on in the order in which they were received to their shipping agents (Messrs Hogg and Robinson).

Imagine such a system! and how uncomfortable any Q. M. G. would be. To cut the matter short, in 1899 from our experiences we arranged that an officer should be attached to the Director of Transports' Office to systematise the despatch of stores and also troops to South Africa and he had an office in the Admiralty and was in telephonic communication with the Q. M. G.'s Office and the D. A. A. G. at the Transport Office at Woolwich Dockyard, who embarks stores under the Q. M. G.'s orders. The arrangement worked most satisfactory, but directly the war ceased, the appointment lapsed and now everything is being run on the old system.

I cannot enter into, as fully as I would wish, the financial side of the matter, but I think you will agree with me that it is eminently unsatisfactory when I tell you that the War Department, India Office and Admiralty pay the salaries and cost of the Director of Transports' Office in the following proportion, annually:—

War Office ...	... £5,300 (up to 1898 it was £4,300).
India Office ...	... £3,000
Admiralty ...	... £2,000

yet the Director of Transports is direct agent of India Office and *not* the direct agent of the War Office, but nestles under the wing of the Junior Lord; and the Admiralty insist on having first call on the Director of Transports in case of any war in which the Navy was also involved.

Delays in correspondence are inevitable, although by private arrangements we went direct to the Director of Transports on minor details. All large question or questions of principle *must* go through the civil side of both offices.

Again the result of the Director of Transports not being the War Office's direct agent is that the War Office has practically no control over expenditure incurred by the Admiralty on their behalf beyond his estimates. I can give any one instances who is interested.

To sum up Q. M. G.'s relationship with the Admiralty.

The solution which would satisfy the War Office (I speak of when I was there, I can't say what the ideas are now, but it still

seems to be applicable) is that an Imperial Transport Board with a Military Member as recommended by the 1861 Committee should be instituted, which would ensure systematising the requisitions in peace and war on the Admiralty and control their expenditure on Army behalf.

In practice this is what really happened, when the present General Auld was attached to the Admiralty during the Boer War and is what will happen again in any other war of any magnitude.

So far as my own views are concerned from my experiences in the Q. M. G.'s Office, I am convinced that the Transport Board should be the organisation in peace, for no one can traverse the fact that your peace organisation should at least be the nucleus of your organisation for war—capable of expansion to the necessary degree, and some officers should be trained in the Admiralty. I am glad to say the two services are gradually getting more in touch, as naval officers now go to our Home Staff College and military officers to Greenwich, in addition to joint Staff Rides in England and India, whilst a large number of naval officers are attached at Aldershot.

Now as regards the War Office, Admiralty and India Office.

I have already stated that the Director of Transports is direct agent of the India Office who correspond direct with him and give him their orders. The effect of this arrangement is more far-reaching than first meets the eye, for whenever the War Office and India Office are at loggerheads over any charges for shipping (i.e., whether they are to the Imperial or Indian charges or in what proportion each is to pay) the pros and cons are submitted by both to the Admiralty who act as a sort of Court of Appeal.

It is needless to say the feeling is at the War Office that the natural tendency of the Director of Transports is to side more with the India Office with whom they are in closest touch. I don't mean to charge them with any unfairness, but it is only human nature which dictates that feeling, just in the same way the War Office, when they press economical arrangements, and suggest approaches to shipping companies to obtain such, feel rather resentful if the Director of Transports apparently urges the case for the S. S. Companies against the War Office.

Finance decides most points and the financial relations between the India and War Offices, in the matter of the Indian Transport service, are fundamentally governed by the broad general principle that the lending of a portion of the British Army to India is a service for which India must pay the cost, and that no expenditure on account of this service must fall on the Imperial Exchequer.

Practically, however, the general cost to India of conveying troops to and from that country is subject to a few modifications on account of:—

(a) A lump sum contribution of £130,000 a year (being some years ago half of the estimated annual cost of £260,000, the Indian Transports service) paid by the War Office to the India Office though

this is subject to periodical revision. The actual cost now is about £330,000 but the War Office still, so far as I know, only give £130,000. This payment was first made about 1901, on the award of a Royal Commission appointed to consider the financial condition of India, the Royal Commission being influenced by the fact that the introduction of the "short service system" had thrown additional transport charges upon Indian revenues; of this point, I am not at all sure myself.

(b) A payment by the War Office to the India Office of the actual cost of certain Indo-Colonial reliefs of units due to the amalgamation, about ten years ago, of the Indian and Colonial rosters of reliefs. The amalgamation of the rosters was decided upon in consequence of the desirability of giving all units sent on foreign tour of service an opportunity of service and training in India before return to the United Kingdom. At the same time, the establishment of British troops in India had to be kept down to its normal level, the result being a shortened Indian tour for many units which would otherwise have served a full term of 17 years in that country. The shortened Indian tour obviously means an extra number of unit reliefs; and the Imperial Government agreed that the cost of any reliefs in excess of the reliefs which would be necessary, if all British troops were sent direct from the United Kingdom to India should be paid from Imperial funds.

Apart from the above-mentioned and a few minor modifications, it will be seen that the cost of sending troops to and from India is primarily a charge which India is liable for, and actually meets.

India pays the whole cost of the ships employed in their troop-ing service, so that the War Office has no actual *claim* to any accommodation on board any of their ships, but when any vacant accommodation *does* exist, a rate per head is arranged if it is desired to despatch any troops to, say, Gibraltar, Malta or Egypt for which the Imperial Government pays. In this, however, any deviation of the ship from the direct line to India for Imperial purposes is undesirable from War Office point of view, otherwise what with delays at ports of call, etc., it works out often cheaper to send the troops to such places as Crete, etc., on freight.

A point which often leads to disputes is when an interchange of units is desired. The India Office argue that the Imperial Government should pay the cost as from home for the units landed at a Colonial station, *i.e.*, they consider their liability is only that from the station at which the unit embarks for India. The War Office successfully contested this but met the India Office by payment of victualling charges of the Imperial unit while the India Office still bear the cost of the ship.

Needless to say, when the Imperial Government arrange for any troops being despatched for their use from India to China or South Africa or elsewhere, they bear the entire cost and give them a free hand in taking and fitting up, etc., of ships.

I cannot help thinking that the best way is to run all trooping as an Imperial service. It would put an end to many disputes and

much correspondence. I must say on Imperial ships that officers and their families are far better treated than on Indian ships. There are innumerable little differences in King's and Allowance Regulations and the Indian ones—for instance, when on duty our officers on a Colonial or Imperial ship are not charged messing, yet as most of you know the Indian Government insist (except in some circumstances) on a vexatious little charge of 2s. a day for messing as from London by sea, though you may travel by the overland route (the total collected by this charge is under £1,500 a year). To my mind equity demands that one set of regulations should guide all passages wherever an officer or his family are conveyed to in our Empire.

I mentioned the cost of the Indian Transport ships was £330,000 and it may interest you to know that the Colonial reliefs in an ordinary year's trooping used to cost about £350,000.

Selection, fitting up and cost of ships for men, horses, stores and hospitals.

The Naval Assistants to the Director of Transports is entrusted with the entire selection and fitting up of ships as transports and of fitting up of freight ships for troops. Prior to 1899 considerable supervision was essential, but now S. S. Companies particularly such as the P. & O., Union Castle, and I expect the B. I., are quite capable of doing it themselves.

The Admiralty keep a register of all suitable ships and their chief difficulty lies in procuring the best ships at a moment's notice, so many suitable ones being on the high seas probably just when they are wanted.

Directly we submitted (as we did for an Army Corps, no small matter!) our requisition on the Admiralty for shipping they were able to ear-mark the ships available almost at once.

I should like to say here that transports from India, Australia, New Zealand and Canada were taken up and fitted locally at first, but later on we sent our own transports to those Colonies.

In August 1899 we asked the Director of Transports how long it would take to despatch 50,000 men and 8,000 horses to South Africa and he replied four or five weeks. Our constant enquiries gave them a hint of what might come, so that they prepared for eventualities by conferring with S. S. Companies, etc., and having all the troops' bedding and hammocks washed and overhauled—bedding was kept in stock at Deptford and Burscough (near Liverpool) for 55,000 and in addition we had in stores 10,000 old pattern horse stalls (but I will mention these later).

On the 30th September we really made the first definite statement to the Admiralty of embarking troops and this was given at a conference held in the War Office. That same night 20 vessels were engaged and we told them we would be ready to embark 24,000 men and 4,000 horses between 21st October—25th October, and I may add that by the middle of November the whole were embarked.

Roughly speaking, it takes 10—12 days fitting an Infantry Transport after her cargo is emptied, etc., and costs £4,000 to £5,000; a horse ship takes 16—17 days though you may hear more optimistic times stated by those who have not tried to do it.

The best ships to take up are as a rule those of about 5,000—7,000 tons for infantry, with plenty of good accommodation for 1st class and for some 2nd class, with good height between decks and good ventilation, also roomy upper decks for exercise and recreation. Speed is not really as a rule such a necessity as good coal capacity and 13—14 knots is what may be termed ocean speed. I have not time to go into such details as survey, ballast crew, etc., (which is 30 per 1,000 tons register and $1\frac{1}{2}$ per 1,000 after), engineers, cooks, stewards, etc., etc., which are primarily naval matters.

If you can, you should always get a ship engaged in the trade of that part of the world to which you wish to transport your troops, as it has many advantages, such as familiarity with the route, her own agents at ports of call, coal bunker capacity especially designed for the voyage, ventilation for the various temperatures she passes through, etc., etc.

As an example of what ships I am thinking of, I may say I refer to the "Majestic" and "Umbria," engaged in the Atlantic trade, in comparison with the "Kildonan Castle" engaged in the Cape trade. All were of some 9,600 tons, all swift; in the former there were innumerable delays in coaling, and in the latter absolutely none (indeed to the best of my recollection she took in 4,000 tons of coal at Southampton with which she made the run to the Cape and back). The Atlantic ships were taken up as an outcome of popular clamour for fast ships, and we had to pay as much as 35s. a ton for them, that is to say, the same as the "Kildonan Castle," they all took exactly the same time to the Cape. The "Kildonan Castle," expensive as she was, was one of the most useful ships we had, as she carried 110 officers and 2,690 men, besides crew. All the big ships were taken up against the Admiralty wishes almost, as they and all of us preferred ships carrying, say, 1,200, *i.e.*, a battalion and a few details, which is a more satisfactory ship all round.

We made out that for long trips a man required $3\frac{1}{2}$ to 4 tons on gross tonnage and a horse with troops $11\frac{1}{2}$ —12.

For short trips it works out man $2\frac{1}{2}$ and horse $4\frac{1}{2}$, whilst for any voyage, however short, with a night thrown in, one ton net per man and 4 per horse must be allowed.

As regards horse ships the very best to get are those engaged in carrying cattle across the Atlantic; our losses, etc., were least on them, but after all losses in horses worked out under 4 per cent, which is not bad for such long voyages (it includes horses from Australia, India, Austria, America, etc.), and the number of horses and mules conveyed in just under three years was over 450,000.

In selecting means of transport it is well to know that the great difference between a transport and a freight ship is that a transport is taken upon a time charter, and you can do what you

like with her, the price being arranged at so much a ton a month. The owner provides the ship, officers and crew, and the Government pays for the coal and also now for the provisions of the officers and troops carried at certain rates per head. You can turn a transport into anything you like, such as a hospital ship, collier or horse ship, or use her as a floating prison; nothing affects the rate you pay, which is ordinarily in peace 15s. to 18s. 6d. a ton a month and upwards; in war, for instance, we paid when there was a popular outcry for faster ships as much as 35s. for the "Kildonan Castle," *i.e.*, about £90,000 for four months' hire, and about that for the "Majestic," but this was abnormal and was gradually reduced as the demands for shipping declined.

As regards freight ships you have no control over the ship, she only calls at certain specified ports of call, which she cannot be diverted from, as probably her insurance would be affected and the owners subject to other liabilities; the conveyance of these ships is arranged for either in a lump sum or more generally at rates per head, owners providing everything.

Another advantage in chartering a transport not generally known is that Government have powers (which are seldom exercised as it would be a bad policy) to keep any transport for any length of time. That means Government can give them notice of termination of contract but owners cannot demand their ship back.

Comparing the cost it was found that for journeys *to and from* South Africa if no undue delays occurred that transports were cheaper; freight FOR A SINGLE JOURNEY is as a rule cheaper but owners won't divert ships.

To complete this section on selection and fitting of ships it may interest you to note the time taken in embarking some of the troops for South Africa.

On the 1st October it was finally decided to send an Army Corps and a Cavalry Division and the Admiralty was warned on that date; 9th October was the first day of mobilisation, the first troops embarked on October 20th, whilst the Army Corps finished embarking on November 10th so far as infantry were concerned and the last mounted unit on November 15th.

The 5th Division was requisitioned for on Admiralty on November 18th, as ready to embark on November 24th. Infantry finished embarking December 13th and mounted troops 21st December.

I should like to finish up by asking you to remember on the Admiralty behalf that it is in the nature of things a more difficult and lengthy matter to select, survey, engage, fit, provision and coal a large number of ships than to prepare troops and their equipment for embarkation in them, even if a sufficient number of suitable vessels were in port at the right moment.

Again the rapidity of fitting is at the mercy of the labour market and many delays were occasioned by patriotic carpenters, etc., striking, and coal-heavers declining to work in wet weather or by

night. Again coaling at St. Vincent and Las Palmas necessitated a steady stream of ships, whilst it was useless to have too many ships arriving at one moment at Capetown.

HORSE SHIPS.

I have already mentioned that the best are the cattle trade ships, mostly found at Liverpool and hitherto unused by Government, though in the late war we took them up and fitted them with the new pattern (8 feet long) stalls. The old pattern stall was 6 foot long, very bulky, took far longer to erect and was unsuitable for cattle trade ships. We had 10,000 in stock however and utilised them where we could on deck, etc.

Just before the war, in April 1899, a Committee assembled (of which I was Secretary) to consider the necessary fittings, etc., which should be kept in stock for horse ships as it was decided to have all preparations made for the despatch of two Army Corps for service abroad instead of one. The Committee in an interim report in July 1899 urged the Secretary of State to purchase 6,000 new fittings, at a cost of £25,000, to complete fittings for even one Army Corps whilst the 16,000 fittings for the 2nd Army Corps worked out to about £73,000, and early in September 1899 submitted our final report, but no sanction was given till the 21st September for any expenditure on Transport requirements, and this is one of the points the Admiralty now quote against the War Office controlling Sea Transport finance and their preparedness. We determined among ourselves to use the trade ships and the new fittings without it, and the results fully justified our recommendations which were approved later. Full reports on this subject will be found in the Blue Books of the war commission over which Lord Elgin presided.

The long new pattern stalls give a horse a chance of stretching which was a great complaint against the old stall; but the one thing against the new stall is the difficulty of cleaning it out as there is no passage in rear of it. To meet this 5 per cent of spare stalls are allowed so as to move horses down one by one, but of course this is very difficult in bad weather. Five per cent of slings are only put on board now for veterinary purposes whilst in the old pattern each horse had a sling, which was quite unnecessary as a horse soon feels his feet and leans to hang on in rough weather. One great advantage of the light new stall is that you can carry many more horses in each ship.

Lots of people you will hear say what on earth do Government pull the trade fittings out of ready made horse trade ships? The answer is simple, for unless you knew the history of every horse previously conveyed, you would run the risk of disease which might go right through your cargo.

Most of the losses on board were attributable to pneumonia notwithstanding that we had Vets to examine every horse before it went on board, and who rejected any with the least sign of pneumonia on them.

Large stabling should always be provided at ports where horses are to embark, and remounts particularly should be under observation for some days before embarking if you can manage it. Liverpool and Tilbury were our best ports for horses, cavalry and artillery, as Southampton is tidal.

As regards the chartering of horse ships many were taken up from abroad by the Remount Department and the cost of freight from home, New Orleans, Canada, South America, Australia, Austria and Spain, I have with me for those who wish to see it, together with the number of horses and mules conveyed. I may say the first division of labour was that the Admiralty conveyed all horses from home and mules from abroad whilst the Remount Department arranged horses from abroad. This continued till late in 1900 when the Admiralty took it all over.

The Yeomanry Committee in December 1899 and January 1900 tried taking up ships but had to give it up and admit they could not do it, so it was handed over to the Admiralty who had to get out some ships and make the best of others which the Yeomanry Committee let themselves in for.

STORES.

All stores at various ports at home are lightered to and from the ship by the Army when it is necessary; the Q. M. G. has a department (then called D. A. A. G. T.) in the dockyard, Woolwich, now termed Director of Military Transports Office, which arranges all lightering and which has under its control all War Department vessels all over the world. This office worked in conjunction with this Q. M. G. 2 and was in direct telephonic communication with the Military Officer at the Admiralty. The D. A. Q. M. G. T. was really our War Office expert in shipping and he had under him, in addition to very able A. S. C. Officers, an Inspector of Shipping and an Assistant Inspector of Shipping. The approximate tonnage shipped by him from 1st October 1899 to 30th June 1902 was 1,260,000 tons of supplies, forage, Ordnance stores and explosives.

The largest consignments of supplies were shipped in lots of 4,000—10,000 tons in about 200 vessels, and for smaller quantities about 215 vessels were used by him, the large majority being mail and intermediate Union-Castle steamers. Ordnance and explosives consisted of over 1,000 shipments during the period in question, i.e. 33 months, in transports, freight ships, etc., and the D. A. A. G. T.'s work consisted not only of lightering in the Thames but also despatch of stores and explosives by rail (very often in special trains) from Woolwich to Southampton, Liverpool, etc., where ships were sailing from. Of course freight was demanded by him from the Director of Transports by telephone or telegraph and appropriated similarly and the whole machine taking it all round worked very smoothly indeed—as besides short notice there were many things to overcome, such as fogs, winds, adverse tides, and delays on S. E. R. in provision of trucks, etc. On the Navy devolves the actual labour of shipping and storing which is done by the hiring of stevedores, etc.

The arrangements for supplies and stores were made to a great extent by the contract branch, and a huge task it was, *vide* estimates for forage and food for 300,000 men and 300,000 horses. At first we thought to use transports but this was soon given up as they might be ordered anywhere on arrival at Capetown, and if the stores were for that port you can see the difficulties. We always had however on each transport 14 days' provisions as shore rations. Approximately 560 voyages were made by ships conveying stores, i.e., food and supplies; and including Ordnance and clothing, etc.; a total of some 875 voyages were made of which 200 were full cargo ships of Government and of course in the case of South Africa supplies were in addition very often obtained locally.

HOSPITAL SHIPS.

Minute specifications for fitting up these have been widely circulated to all foreign stations so that a hospital ship can be fitted up anywhere now; the main essentials are height between decks, good hatchways, lots of deck cabins and large refrigerator.

Latterly we had hospital ships *and* sick carriers; the former was entirely for sick; in the latter men in health were put in the fore-part and the after-part all hospital only.

The best record of fitting up a hospital ship was a sudden demand too, it was for Benin, and on a Saturday afternoon the Admiralty were asked to send it by the following Saturday; the "Malacca" was the most convenient ship—she was just passing Gravesend for Hamburg laden with cargo—but the owners (the P. & O.) kindly stopped her, brought her back to Albert Docks and she sailed the following Saturday as the most perfectly fitted hospital ship—real good work. Though at Durban a transport was converted into a satisfactory hospital ship in five days immediately after Ladysmith, and altogether six hospital ships were fitted out at Durban from plans sent from home, and the cost of conversion varied from £3,000 for the "Lismore Castle," but the average for the other five was about £6,000 and took 10—12 days to carry out.

The two first sent from home—the "Spartan" and "Trojan" (sister ships)—were patterns; but they were kept at the Cape and practically used as stationary hospitals, which was never intended.

Procedure up to and prior to embarkation.

The A. G. requisitions on Q. M. G. for the shipping of the army. In the late war we in the Q. M. G.'s Office were merely passed a table of the whole Army Corps among which we found some units which were incomplet in clothing and transport and these had to be kept back occasionally; this applied constantly in the later divisions embarked and anyone in Q. M. G.'s Office would be well advised to make sure all units are ready before allotting them to ships as any change at the last moment affects routes, time-tables, etc.

Requisition is made by Q. M. G. on the Director of Transports for the number of officers and men and tonnage of stores required.

Thereupon the *method* of conveyance is decided on by the Admiralty; that is to say whether transports or freight will be employed, and he notifies Q. M. G. of the decision and gives the *approximate* date of embarkation for the convenience of the unit, etc.

Directly the Director of Transports gets our requisition his naval assistant (if it is to be done by transport) selects ships from his register and goes off with his surveyors to inspect them, whilst the Director of Transports or Assistant Director of Transports interviews the owners as to their willingness to hire their ships and arranges the cost.

Once taken up, the naval officers detailed for places of embarkation daily superintend and hasten on the work of fitting a ship, and when ready to receive her troops or horses she is again inspected and she is inspected at each port of call by military or naval authorities.

The inspection *after* a ship is pronounced fitted is a *joint* one of two naval and two military officers who certify to the accommodation, ventilation, cooking, boats, etc. A military medical officer accompanies the Board and expresses his opinion on the provisions, medical comforts, sanitary arrangements, etc., and a veterinary officer similarly attends when the ship carries horses.

There is also a *final* inspection after the troops have embarked and all are seated at their mess tables which is to ensure that every man is properly berthed and that the ship is ready to proceed to sea in every respect having regard to numbers, provisions, etc., on board.

I should like to interpose a word about these orders for embarkation; we found that King's Regulations were not being carried out in many cases and that there was so little knowledge of the system of embarkation on arrival at ports that we drew up regulations and even a sketch of gangways showing the usual entrances to ships, and sent these with each route. Notwithstanding these elaborate precautions often troops arrived having totally disregarded them and ignorant of the procedure required. For instance, some came with all the kitbags and valises mixed up in a van or two, all of which had to be sorted, and I remember in one case this took 2 to 3 hours. Such an occurrence means that staff officers present at entraining were not doing their duty, and that the officer in command for the sake of a little system and carrying out of orders was preparing himself for a very bad three or four hours on arrival at the port of embarkation.

When a unit carried out its orders we found that 1,000 men could be embarked and be ready to sail in an hour.

It is absolutely essential that not only should a big port of embarkation like Southampton have a nucleus of a good embarking staff, but that sheds and barracks should be erected. I hear this is *at last* being done.

As regards the working of the Naval and Military staff at the ports of embarkation and disembarkation this requires officers of great tact if no friction is to arise—really it *must* be a matter to give and take.

If you want to draw a chalk line where the Army ends and the Navy begins it would be half way up the gangway, though the military embarking staff naturally allot accommodation and assist at the inspection on the ship.

I think most strongly that all arrangements up to the moment prior to troops embarking at docks should remain under the Military Staff Officer.

VOYAGE REPORTS.

At the end of the voyage the O. C. Troops makes out a voyage report wherein he can bring everything unsatisfactory in provision, fitting, etc., to light. This comes to the Q. M. G., who passes it, with any comments, to the Director of Transports or others concerned.

The first vessels from home were taken up with short warning and fitted up at high pressure and were a very mixed lot, varying from 1st class passenger boats to cattle and cargo boats, and I must say some of the voyage reports did not spare the Admiralty who were very naturally grieved and hurt at the caustic criticism, and I am bound to say my sympathies on that subject were with them, and I think yours would have been if you had had the same task set you. Remember, on October 1st they were requisitioned on for shipping for an Army Corps and told 20,000 would be ready in 19 days. The chief complaints were—*overcrowding*, accounted for by the fact, as most of you know, that numbers embarked depend on the numbers that can be seated at table and not on hammock accommodation. This is a relic of Indian troopships, where one-third were on watch on deck, and sooner or later must, I should say, be at least modified. *Messing* caused by the provision of salt beef and pork mainly which I will refer to under victualling. *Basins*: The Admiralty maintained that to increase the numbers would cramp the already overcrowded deck-space, and contend in a man-of-war basins do not exist, except in stokers' washplaces, and the men wash in their mess tubs—not a very appetising idea.

Horse ships were the cause of many complaints in the first flight of ships owing to want of experience, though the losses don't bear out the complaints; and a very large proportion of cavalry officers had never seen a horse on a ship so their opinions could not be taken as expert and required discounting. Many wrangles also took place over the new fittings as officers took the Transport Regulations as a guide and latterly we sent each Veterinary Officer specifications of the new fittings and also C. O.'s which stopped the complaints. No doubt also the horses on the first ships were stowed too closely and measured beyond their carrying capacities.

The voyage reports, however, are invaluable and led to many modifications and improvements and Commanding Officers should be impressed by Staff Officers at places of disembarkation with the desirability of bringing to light every point they consider capable of improvement.

DISEMBARKATION.

I am not competent to speak of the disembarkations in South Africa and elsewhere, but so far as we were concerned in our disembarkations at home we arranged to be wired to directly the ships left South Africa; and the names of officers and numbers of each regiment on board were wired so that train service was ready on their arrival at Southampton, for all invalids and those for depôts.

In the case of invalids the numbers were kept separate and the Consuls at Madeira, Las Palmas and St. Vincent boarded ships and wired us the cases specifying lying down cases, etc., so that we could have a hospital train ready alongside on arrival to take them to Netley; the line runs, I may add, into the back of the hospital, and we purchased an up-to-date hospital train from the South-Western Railway, chiefly for the conveyance to Netley.

As regards the arrival of ships at the Cape the G. O. C. was notified by us by wire, so as to systematise his disembarkations, of the departure of each ship from England, India, Colonies and elsewhere together with details of horses, mules, provisions or equipment that it was conveying.

VICTUALLING ON BOARDSHIP.

I do not intend to waste your time by kicking a dead horse and will only say victualling from Naval Yards is dead and buried.

The first ships in 1899 were victualled to a great extent with the salted beef and pork pronounced nauseous by all, particularly the beef; the naval authorities said that sailors had stronger stomachs than soldiers, but I must say all our sympathy was with the soldier. Anyhow, owners victual now and did so from 1899; officers they charge Government 6s. 6d., for ladies 5s. 6d. and men 10d. to 1s. as arranged, and excellent it is; so no one can grumble in future.

Special rates up to 1s. 6d. about were paid for victualling Yeomanry and Volunteers, and where Regulars had to be put on the same ship they benefited also by scale.

As regards canteens on board, the Admiralty based the requirements on Indian trooping experiences, but this proved fallacious, as reservists turned up with large sums in many instances at their disposal. One example will show you the difficulties however, e.g., two Cunard ships had exactly the same amount of men and goods on board; the stock of one was sold out soon after St. Vincent, whilst the other had a large surplus stock on arrival at Capetown.

PORTS IN THE UNITED KINGDOM.

I need not go into this beyond saying that *Southampton* is by far the best port for infantry, having large docks, excellent wharfage, plenty of cranes, fine sheds with trains running alongside and equi-distant from Aldershot or Salisbury—in fact at Southampton two-thirds of the force from the United Kingdom embarked, i.e., some 230,000. Southampton in addition to all its local conveniences

is close to Netley (*and* to Osborne); and for horses though quite convenient it is tidal, which is always a little disadvantageous.

As a general rule you will find five infantry ships a day at Southampton and two at any other port is all you can manage, and two cavalry or artillery ships at any port.

RAILWAYS, ETC.

The Railway Companies proved themselves equal to all our demands on them. Our biggest strain was on October 20th, 21st, and 22nd, of five ships on two of the days and four on the other, conveying some 5,000 men with their horses, etc., was nothing to them naturally (though they did take 20 specials a day), when you think of any bank holiday or race traffic. Usually the Admiralty could only give a few days' notice of fixed dates for embarkations and these were occasionally changed owing to fogs delaying ships or strikes of carpenters, etc.; but the Railway Companies always rose to the occasion and fixed up their time-tables in 12 or 24 hours. We sent our demands by messengers and an official of the Railway Companies brought the time-tables so that we could say if it suited, etc. If the traffic had to pass over several railway systems the Company at the port of embarkation worked out the time-table with the others and was responsible; absolutely no hitch occurred that I can call to mind. We arranged to have all troops on board by noon so that the ship could start at 2 P.M.; wherever possible regimental baggage, guns and wagons accompanied troops except heavy R. E. equipment which was sent the day before, and we found it worked all right without advanced parties; it suited railways and us better too.

I need hardly say that in England no difficulty was experienced at any places of embarkation, but it is most desirable that we should have sheds to put troops in, in case of delays at any rate close to docks. Thanks to the civility of the Union Castle at Southampton and the P. & O. at Albert Docks we were lent some of theirs as we only possess one shed at the Empress Dock, Southampton.

Without going into further details I can only add that we have much to thank the Railway Companies for throughout the war.

SOUTH AFRICA.

I have not time to go into the details of hire and demurrage, etc., of ships which are extensive; but if any one wishes to see the cost of each ship, store, transport and freight ship I will show them the returns presented to the House of Commons on the subject, and also a return of numbers embarked to and from South Africa during the war.

For those who have not time to go into it, I may say we embarked from England, India, Colonies, etc., a total of about 400,000 troops, 352,534 horses, and 104,000 mules—in over 400 different vessels which made some 1,500 voyages—representing about 9,000,000 miles steaming exclusive of coast movements at the Cape and about 1,000,000 miles of cross voyages to India, Australia, Bermuda, etc., etc., carrying some 800,000 souls.

The average tonnage of the 116 transports was 6,400 tons.

The losses in horses were about 3½ per cent and in mules 2½ per cent.

The accidents and wrecks were marvellously few, being the "Ismore" at St. Helena Bay about a day north of Capetown of some 315 horses.

The "Suffolk" off Cape Francis of some 900 horses.

The "Corinthia" of 400 mules, and two freight store ships the "Denton Grange" and "Madeira," the latter by fire.

In addition the "Persia" broke a shaft in the Bay and another ship had to be sent to St. Vincent to take on her troops; and the "Rapidan" off Holyhead which had an accident in her engine-room and got into the trough of the sea and lost a lot of horses and had to return to Liverpool. Such a record speaks volumes for the mercantile marine.

The total bill of the Admiralty for hire of ships was just over £30,000,000 and a summary of cost was sent to Q. M. G. by the Director of Transports monthly; needless to say we reduced the numbers of transports as rapidly as we could. I should put the total bill for Admiralty, Remount Department, India and Colonies, etc., at something like £34,000,000—a nice bill for 3 years' shipping!

Shipping the troops home was by no means a small matter as by September 1902 from November 1899 we had brought home 338,000 men, 1,292 women, 1,813 children, and 2,140 horses and shipped home the Colonial contingents from South Africa.

In June and July 1902 alone, 53,800 embarked, and by 31st August 94,000, and by the end of September 133,000.

The largest shipment during any one month from home was in February 1900, when we embarked 33,500 and 5,500 horses though between October 20th, 1899, and November 30th we embarked 58,000 men and 9,000 horses.

There were a lot of miscellaneous services connected with Sea Transport which gave trouble and anxiety, such as deportation of undesirables.

This disposal of undesirables was a very awkward item, which had to be done in communication with Home, Colonial and Foreign Offices.

The first batch we landed at Flushing, a whole ship load, and this led to considerable correspondence as many of them were penniless and somehow equally undesirable to the Dutch.

The total deported was—men 3,280, women 958, and 1,360 children, and except in the first case they were sent in small batches.

On arrival of any ship conveying them Police Officers and Cook's men took down their names and they were then handed over to Cook & Sons.

They generally arrived at Southampton, a wire being sent to Waterloo before the departure of the train conveying them to London to ensure omnibuses meeting them; thence they were as a rule conveyed to Liverpool St. where they were given a meal and a

through ticket to the frontier of their countries ; and in order to avoid charges of sending them penniless we gave on departure by steamer each man £1, each women 10s. and each child 5s.

Taking it all round the above worked very well and in most cases they were despatched from London the very day they arrived. When this was not possible we paid Cook so much a head to put them up in a little hotel in Euston road or in the Scandinavian or Jews home. Every nationality in Europe was represented, but many went to Holland, though I remember one family being sent to Buenos Ayres and another to Java. In many cases it was evident they had no desire to go to their country, as most had evidently left the country, for their country's good.

Deportation of Boer Prisoners.

The deported *Boer prisoners* were no small item, and these were sent to Ceylon, India, St. Helena and Bermuda. On the whole they were well managed on boardship ; one of the first lots whilst being embarked at Capetown became troublesome and insubordinate when waiting for batches to join the ship, so it was sent to sea in a stiff gale for a day or two, and they were so deadly ill that when landed again the painful disclosures to their friends of the effects checked any further similar outbreaks for many a month.

Ships were kept as floating prisons in some cases, *e.g.*, the "Caledonian" at Durban and subsequently the "Columbian" and "Chicago" till the numbers justified a voyage to their place of interment altogether.

5,442	were sent to	St. Helena.
3,952	" "	India.
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or a total of 21,535.

Discharged Colonials.

A great number of Colonials found their way to South Africa on horse ships at their own expense and joined South African Colonial Corps. When they were time expired and there was no transport to their Colonies available these men were shipped to England and on production of their discharge certificate were sent through Cook & Sons to their homes. I need not say they gave no end of trouble ; latterly they were sent through the Provisional Battalion at Shorncliffe.

Cuttlmen.

These were men who landed in South Africa after a voyage with animals and who had no contract with the S. S. Company for conveyance to their homes. They were shipped here on transports and sent to their homes by Messrs. Houlder Bros. 1,485 were thus dealt with and nice specimens of humanity some of them were.

Directly this was reported from South Africa, we made Steam Ship Companies agree to dispose of these men themselves.

Particulars of troops, etc., shipped at Southampton Docks from the commencement to the end of the War, October 6th, 1899, to June 17th, 1902.

		1899. (From Oct. 6th.)	1900.	1901.	1902. (To June 17th.)	Total.
No. of vessels	...	56	121	114	74	365
No. of officers	...	1,853	3,620	3,033	1,605	10,111
No. of men	...	48,227	74,523	60,986	34,143	217,879
No. of horses	...	4,065	8,974	7,545	3,333	23,917
No. of guns	...	63	26	...	...	89
No. of vehicles	...	603	228	...	...	831
Tonnage of vessels.	Gross ...	310,935	774,062	698,889	412,866	2,196,752
	Net ...	212,480	474,946	449,222	261,806	1,398,454

Stores and provisions	...	...	...	54,063	tons
Baggage, equipment and ammunition	...	...	...	27,987	„
Military engines, wagons, etc.	...	...	...	1,586	„
			Total	...	83,636 tons.

BATTLE OF LÜTZ B

16TH NOVEMBER, 1632

A. A. German array.

B. B. B. Swedish Army on the mar

C. C.do.array.

D.do.reserve.

E.do.baggage.

F. Pappenheim's Cavalry app

Mühlg

THE BATTLE OF LUTZEN AND THE NEW MONUMENT TO GUSTAF ADOLF.

BY 'LIEUT.-COLONEL THE HON. E. NOEL.

On the 6th of November last year, the 275th anniversary of the battle, a new monument in shape of a chapel was solemnly inaugurated on the field of Lützen to the memory of the great Swedish King, who there met his death.

This date is according to the old style, which was at that period in use in northern, as it is still even at the present day, in eastern Europe. By our present reckoning it would be the 16th November 1632.

Before speaking further of the monument, in order to render the site more intelligible to the reader, it will be well to recall the circumstances of the battle and of the King's death.

Gustaf Adolf was moving up from South Germany to engage the Imperial German army which lay near Leipzig under command of Wallenstein. Wallenstein advanced towards Erfurt but halted at Weissenfels on the Saale. Gustaf Adolf marched from Erfurt November 8th (N. S.) and next day reached Naumburg on the Saale eight miles above Weissenfels. Here he put his troops into cantonments and began to entrench, and this led Wallenstein to think that he did not intend to advance further.

Wallenstein's Lieutenant Pappenheim was anxious to return to his former theatre of operations in Lower Saxony and Westphalia, and at a council of war it was decided that he should do so, but that he should first besiege the castle of Moritzburg near Halle. For this purpose he set out on the 14th with 10,000 men, and Wallenstein, whose forces were now reduced to about 20,000, retired to the neighbourhood of Lützen half way to Leipzig, leaving a rear guard at Weissenfels.

Gustaf Adolf, whose army was only about 20,000 strong, wished, before attacking the superior force of Wallenstein, to effect a junction with the armies of Saxony and Lüneberg, and with this view he started on the 15th for Grimma intending to cross the Elster at Pegau.

From a letter intercepted this day, Gustaf Adolf became aware of the detachment of Pappenheim, and with instinct of a fighting General he resolved to attack Wallenstein forthwith, without waiting for his expected allies. He changed the direction of his march accordingly on Lützen, intending to fall upon his enemy that same afternoon before he could have time to recall Pappenheim.

At Rippach he came upon Wallenstein's rear guard who succeeded in delaying him long enough to make it too late for an attack that

Thereupon the *method* of conveyance is decided on by the Admiralty, that is to say whether transports or freight will be employed and he notifies Q. M. G. of the decision and gives the *approximate* rate of embarkation for the convenience of the unit, etc.

Directly the Director of Transports gets our requisition his naval assistant (if it is to be done by transport) selects ships from his register and goes off with his surveyors to inspect them whilst the Director of Transports or Assistant Director of Transports interviews the owners as to their willingness to hire their ships and arranges the cost.

Once taken up, the naval officers detailed for places of embarkation daily superintend and hasten on the work of fitting a ship and when ready to receive her troops or horses she is again inspected and she is inspected at each port of call by military or naval authorities.

The inspection *after* a ship is pronounced fitted is a *general* one of two naval and two military officers who certify to the accommodation, ventilation, cooking, boats, etc. A military medical officer accompanies the Board and expresses his opinion on the provisions, medical comforts, sanitary arrangements, etc., and a veterinary officer similarly attends when the ship carries horses.

There is also a *final* inspection after the troops have embarked and all are seated at their mess tables which is to ensure that every man is properly berthed and that the ship is ready to proceed to sea in every respect having regard to numbers, provisions, etc., on board.

I should like to interpose a word about these orders for embarkation; we found that King's Regulations were not being carried out in many cases and that there was so little knowledge of the system of embarkation on arrival at ports that we drew up regulations and even a sketch of gangways showing the usual entrances to ships, and sent these with each route. Notwithstanding these elaborate precautions often troops arrived having totally disregarded them and ignorant of the procedure required. For instance some came with all the kitbags and valises mixed up in a van or two, some of which had to be sorted, and I remember in one case this took 2 to 3 hours. Such an occurrence means that staff officers present at entraining were not doing their duty and that the officer in command for the sake of a little system and carrying out of orders was preparing himself for a very bad three or four hours on arrival at the port of embarkation.

When a unit carried out its orders we found that 1,000 men could be embarked and be ready to sail in an hour.

It is absolutely essential that not only should a big port of embarkation like Southampton have a nucleus of a good embarkation staff but that sheds and barracks should be erected. I hear this is at last being done.

As regards the working of the Naval and Military staff at the ports of embarkation and disembarkation there is a great deal to be said, but the great fact if no friction is to arise—no *what a mess*—is a matter of *good* and *bad* take.

If you want to draw a chalk line where the Army ends and the Navy begins it would be half way up the gangway, though the military embarking staff naturally allot accommodation and assist at the inspection on the ship.

I think most strongly that all arrangements up to the moment prior to troops embarking at docks should remain under the Military Staff Officer.

VOYAGE REPORTS.

At the end of the voyage the O. C. Troops makes out a voyage report wherein he can bring everything unsatisfactory in provision, fitting, etc., to light. This comes to the Q. M. G., who passes it, with any comments, to the Director of Transports or others concerned.

The first vessels from home were taken up with short warning and fitted up at high pressure and were a very mixed lot, varying from 1st class passenger boats to cattle and cargo boats, and I must say some of the voyage reports did not spare the Admiralty who were very naturally grieved and hurt at the caustic criticism, and I am bound to say my sympathies on that subject were with them, and I think yours would have been if you had had the same task set you. Remember, on October 1st they were requisitioned on for shipping for an Army Corps and told 20,000 would be ready in 19 days. The chief complaints were—*overcrowding*, accounted for by the fact, as most of you know, that numbers embarked depend on the numbers that can be seated at table and not on hammock accommodation. This is a relic of Indian troopships, where one-third were on watch on deck, and sooner or later must, I should say, be at least modified. *Messing* caused by the provision of salt beef and pork mainly which I will refer to under victualling. *Basins*: The Admiralty maintained that to increase the numbers would cramp the already overcrowded deck-space, and contend in a man-of-war basins do not exist, except in stokers' washplaces, and the men wash in their mess tubs—not a very appetising idea.

Horse ships were the cause of many complaints in the first flight of ships owing to want of experience, though the losses don't bear out the complaints; and a very large proportion of cavalry officers had never seen a horse on a ship so their opinions could not be taken as expert and required discounting. Many wrangles also took place over the new fittings as officers took the Transport Regulations as a guide and latterly we sent each Veterinary Officer specifications of the new fittings and also C. O.'s which stopped the complaints. No doubt also the horses on the first ships were stowed too closely and measured beyond their carrying capacities.

The voyage reports, however, are invaluable and led to many modifications and improvements and Commanding Officers should be impressed by Staff Officers at places of disembarkation with the desirability of bringing to light every point they consider capable of improvement.

DISEMBARKATION.

I am not competent to speak of the disembarkations in South Africa and elsewhere, but so far as we were concerned in our disembarkations at home we arranged to be wired to directly the ships left South Africa; and the names of officers and numbers of each regiment on board were wired so that train service was ready on their arrival at Southampton, for all invalids and those for depots.

In the case of invalids the numbers were kept separate and the Consuls at Madeira, Las Palmas and St. Vincent boarded ships and wired us the cases specifying lying down cases, etc., so that we could have a hospital train ready alongside on arrival to take them to Netley; the line runs, I may add, into the back of the hospital and we purchased an up-to-date hospital train from the South-Western Railway, chiefly for the conveyance to Netley.

As regards the arrival of ships at the Cape the G. O. C. was notified by us by wire, so as to systematise his disembarkations of the departure of each ship from England, India, Colonies and elsewhere together with details of horses, mules, provisions or equipment that it was conveying.

VICTUALLING ON BOARDSHIP.

I do not intend to waste your time by kicking a dead horse and will only say victualling from Naval Yards is dead and buried.

The first ships in 1899 were victualled to a great extent with the salted beef and pork pronounced nauseous by all parties. Even the beef, the naval authorities said that sailors had stronger stomachs than soldiers, but I must say our sympathy was with the soldier. Anyhow, owners victual now and did so from 1890; officers they charge Government 6s. 6d. for ladies 5s. 6d. and men 10d. to 1s. as arranged and excellent it is; so no one can grudge the future.

Special rates up to 1s. 6d. about were paid for victualling Yeomanry and Volunteers, and where Regulars had to be put on the same ship they benefited also by sea.

As regards canteens on board, the Admiralty based their requirements on Indian trooping experiences but this proved to be a failure as reservists turned up with large sums in many instances at their disposal. One example will show you the difficulties. However, 1899, two Cunard ships had exactly the same amount of men and goods on board, the stock of one was sold out soon after St. Vincent whilst the other had a large surplus stock on arrival at Cape Town.

PORTS IN THE UNITED KINGDOM.

I need not go into this beyond saying that Southampton is by far the best port for infantry having large docks, excellent wharfrage, plenty of cranes, etc. It is with troops sailing at night and quite distant from Admiralty or Secretary of War at Southampton, two-thirds of the force from the United Kingdom embarked, viz., some 250,000. Southampton in addition to all its local conveniences

is close to Netley (*and* to Osborne); and for horses though quite convenient it is tidal, which is always a little disadvantageous.

As a general rule you will find five infantry ships a day at Southampton and two at any other port is all you can manage, and two cavalry or artillery ships at any port.

RAILWAYS, ETC.

The Railway Companies proved themselves equal to all our demands on them. Our biggest strain was on October 20th, 21st, and 22nd, of five ships on two of the days and four on the other, conveying some 5,000 men with their horses, etc., was nothing to them naturally (though they did take 20 specials a day), when you think of any bank holiday or race traffic. Usually the Admiralty could only give a few days' notice of fixed dates for embarkations and these were occasionally changed owing to fogs delaying ships or strikes of carpenters, etc.; but the Railway Companies always rose to the occasion and fixed up their time-tables in 12 or 24 hours. We sent our demands by messengers and an official of the Railway Companies brought the time-tables so that we could say if it suited, etc. If the traffic had to pass over several railway systems the Company at the port of embarkation worked out the time-table with the others and was responsible; absolutely no hitch occurred that I can call to mind. We arranged to have all troops on board by noon so that the ship could start at 2 P.M.; wherever possible regimental baggage, guns and wagons accompanied troops except heavy R. E. equipment which was sent the day before, and we found it worked all right without advanced parties; it suited railways and us better too.

I need hardly say that in England no difficulty was experienced at any places of embarkation, but it is most desirable that we should have sheds to put troops in, in case of delays at any rate close to docks. Thanks to the civility of the Union Castle at Southampton and the P. & O. at Albert Docks we were lent some of theirs as we only possess one shed at the Empress Dock, Southampton.

Without going into further details I can only add that we have much to thank the Railway Companies for throughout the war.

SOUTH AFRICA.

I have not time to go into the details of hire and demurrage, etc., of ships which are extensive; but if any one wishes to see the cost of each ship, store, transport and freight ship I will show them the returns presented to the House of Commons on the subject, and also a return of numbers embarked to and from South Africa during the war.

For those who have not time to go into it, I may say we embarked from England, India, Colonies, etc., a total of about 400,000 troops, 352,534 horses, and 104,000 mules—in over 400 different vessels which made some 1,500 voyages—representing about 9,000,000 miles steaming exclusive of coast movements at the Cape and about 1,000,000 miles of cross voyages to India, Australia, Bermuda, etc., etc., carrying some 800,000 souls.

The average tonnage of the 116 transports was 6,400 tons.

The losses in horses were about 3½ per cent and in mules 2½ per cent.

The accidents and wrecks were marvellously few, being the "Ismore" at St. Helena Bay about a day north of Cape town of some 315 horses.

The "Suffolk" off Cape Francis of some 900 horses.

The "Corinthia" of 400 mules, and two freight store ships the "Denton Grange" and "Madora," the latter by fire.

In addition the "Persia" broke a shaft in the Bay and another ship had to be sent to St. Vincent to take on her troops, and the "Rapidan" off Holyhead which had an accident in her engine room and got into the trough of the sea and lost a lot of horses and had to return to Liverpool. Such a record speaks volumes for the nautical marine.

The total bill of the Admiralty for hire of ships was just over £30,000,000 and a summary of cost was sent to Q. M. G. by the Director of Transports monthly, needless to say we reduced the numbers of transports as rapidly as we could. I should put the total bill for Admiralty, Remount Department, India and Colonies etc. at something like £34,000,000— a nice bill for 3 years shipping.

Shipping the troops home was by no means a small matter as by September 1902 from November 1899 we had brought home 338,000 men, 1,292 women, 1,813 children, and 2,140 horses and shipped home the Colonial contingents from South Africa.

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They generally arrived at Southampton, a few being sent to Wexham to meet the departure of the train conveying them to London to our representatives meeting them, thence they were as a rule conveyed to Liverpool St. where they were given a meal and a

through ticket to the frontier of their countries; and in order to avoid charges of sending them penniless we gave on departure by steamer each man £1, each women 10s. and each child 5s.

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Deportation of Boer Prisoners.

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Total		83,626 tons	...

BATTLE OF LÜTZE

16TH NOVEMBER, 1632

A. A. German array.

B. B. B. Swedish Army on the march.

C. C. do. do. array.

D. do. do. reserve.

E. do. do. baggage.

F. Pappenheim's Cavalry appt.

Mühlg

THE BATTLE OF LUTZEN AND THE NEW MONUMENT TO GUSTAF ADOLF.

BY LIEUT.-COLONEL THE HON. E. NOEL.

On the 6th of November last year, the 275th anniversary of the battle, a new monument in shape of a chapel was solemnly inaugurated on the field of Lützen to the memory of the great Swedish King, who there met his death.

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Before speaking further of the monument, in order to render the site more intelligible to the reader, it will be well to recall the circumstances of the battle and of the King's death.

Gustaf Adolf was moving up from South Germany to engage the Imperial German army which lay near Leipzig under command of Wallenstein. Wallenstein advanced towards Erfurt but halted at Weissenfels on the Saale. Gustaf Adolf marched from Erfurt November 8th (N. S.) and next day reached Naumburg on the Saale eight miles above Weissenfels. Here he put his troops into cantonments and began to entrench, and this led Wallenstein to think that he did not intend to advance further.

Wallenstein's Lieutenant Pappenheim was anxious to return to his former theatre of operations in Lower Saxony and Westphalia, and at a council of war it was decided that he should do so, but that he should first besiege the castle of Moritzburg near Halle. For this purpose he set out on the 14th with 10,000 men, and Wallenstein, whose forces were now reduced to about 20,000, retired to the neighbourhood of Lützen half way to Leipzig, leaving a rear guard at Weissenfels.

Gustaf Adolf, whose army was only about 20,000 strong, wished, before attacking the superior force of Wallenstein, to effect a junction with the armies of Saxony and Lüneberg, and with this view he started on the 15th for Grimma intending to cross the Elster at Pegau.

From a letter intercepted this day, Gustaf Adolf became aware of the detachment of Pappenheim, and with instinct of a fighting General he resolved to attack Wallenstein forthwith, without waiting for his expected allies. He changed the direction of his march accordingly on Lützen, intending to fall upon his enemy that same afternoon before he could have time to recall Pappenheim.

At Rippach he came upon Wallenstein's rear guard who succeeded in delaying him long enough to make it too late for an attack that

day, and to give Wallenstein time to collect his forces and prepare for battle.

Wallenstein drew up his army parallel to the Lützen-Leipzig high road, with his right on the Galgenberg just north of Lützen where there were some windmills and millers' cottages. His cavalry, which formed more than a third of his force, were set up in two lines on either wing, the infantry in four masses, ten-deep, in form of a rough cross in the centre. A fifth mass was placed on the extreme right near Lützen. The artillery was in two batteries, one on the right near the windmills in a slanting position, the other in the centre in front of the foremost mass of foot. The road had a ditch on each side and was made into an entrenchment held by a double row of musketeers.

The army was probably further back from the road than it appears in the annexed sketch. Wallenstein's right was well covered by the village which was large and surrounded by a wall, with orchards outside, and to secure himself further from attack from that direction he had the village set on fire. He sent messages to Pappenheim to return with all speed, pushing on himself with the horse.

Gustaf Adolf resumed his march early on the morning of the 16th, left the high road at Röcken and moved across country in two columns which were to form his two battle lines, the Reserve and Baggage making a third column.

His army was drawn up in two lines and a reserve, cavalry on the wings, infantry in the centre. Of the former, the first line right wing were all Swedish under the King's personal command; the rest were composed of German auxiliaries. Of the foot there were four brigades in first line, three in second and one in reserve: those in first line were from right to left, the Swedish, the Yellow, the Blue, and the Green: the Yellow included the Swedish Guards under command of Count Nils Brahe who also commanded the whole first line of foot. The heavy guns were in front of the centre, the light distributed along the line, five in front of each foot brigade.

A thick fog hid the armies from one another and delayed the opening of the battle.

It will be seen from the sketch that the Swedish line was formed obliquely to that of the enemy, and that it also outflanked it. There were no *military* historians in the 17th century, but the following points noted by various historians who have left a record of the battle call for special attention:—

1. That the ground along the Muhlgraben S.-E. of Lützen was marshy.
2. That the Swedish army crossed the Muhlgraben about a thousand ells from Lützen. (A Swedish ell = 1.95 English feet.)
3. That after crossing it followed the direction of the Flossgraben.
4. That the right wing stretched beyond the Flossgraben.
5. That the right of the cavalry (right wing) was fully engaged before the left crossed the road.

6. That the infantry brigades reached the road in succession, in the order they stood from right to left.

7. That the infantry was fully engaged before the left of the cavalry (right wing) crossed the road.

8. That the Blue Brigade—third from the right—came upon the enemy's central battery.

9. That the first and second brigades had to incline to the left to attack the enemy's foot.

10. That when the King moved to the left of his immediate command his left regiment had only just got across the road.

The position of the Swedish line of battle as shown in the sketch is in accordance with all these conditions. The delay experienced in their advance by the left of the cavalry (right wing 1st line) is accounted for by their having to cross the Flossgraben before attaining the road. The Flossgraben is a deep ditch, with steep banks, and had about a foot of water at the bottom.

As it was the custom at this period, and indeed long after, for battles to be fought in strictly parallel order, it has been taken for granted that this battle was also a parallel one. To account for the circumstances just noted it has been suggested that the road had a bend, forming an elbow towards the Swedes, between the village and the Flossgraben, and it is said that the road is shown so in some old maps, while in others it is straight.

The "Schwedenstein," the first monument, stands on the very brink of the road on its south side. If at the time of the battle there was a bend in the road, it would then have been on the north side. Now if the peasants were able to get the stone over the road, why did they stop short of the place where the King's body was found? That they should have stopped on reaching the road is quite intelligible and that they left the stone there, as near as they could get to the true spot.

Secondly, the Swedish army has been represented as wholly to the left of the Flossgraben, the extreme right of the line being where in the accompanying plan the right of the infantry is shown. In this case, if the road were straight the whole line would have reached it together; if the road had a bend the foot would indeed have reached it in the order stated—the right brigade first, but the horse would have come to it before the foot, or, supposing the cavalry to have been beyond the elbow, then their left would have reached the road before their right. In any case the Blue brigade—third from the right—would not have been in front of the enemy's central battery, and the left wing horse must have stood in the marsh with the village of Lützen in front of them.

The country is quite flat and open and there is no apparent reason for the road to run otherwise than direct on Leipzig as it does now. It seems likely therefore that the bend in the road is a conjecture made to suit the assumption that the line of battle was parallel. By a comparison of what can be culled from various histories with the actual topography of the battlefield the idea is

forced upon one that the Swedish line was formed not parallel but oblique to that of the enemy.

This obliquity of the Swedish line is perhaps the most remarkable feature of this remarkable battle: we here find the Great Frederick's famous "oblique order" anticipated by more than a century.

When we further consider the strength of the right wing, and that the King himself here took immediate command and stationed himself with the right regiment, we discern the principle of making the main effort on one extremity of the enemy's position, and that extremity the one where success promises to be most decisive, for Wallenstein's line of retreat was towards Leipzig. The left was protected from counter-attack—which indeed was not to be expected from a General of Wallenstein's type—by the marsh and by the reserve. The Swedish King here established the fundamental principle of grand tactics.

The battle began by a cannonade as soon as the fog cleared followed by a general advance of the Swedish first line about noon. The right regiments of horse were successful against the enemy's left, but were checked by their second line who were mostly Cuirassiers. The first and second infantry brigades fell upon the front and left masses of the enemy's foot, while the third captured the central battery. The fourth brigade diverged to the left near the village and the left wing engaged the enemy's right. The heavy artillery was moved into the gap between the third and fourth brigades, a manœuvre in which we are reminded of Napoleon's action at the battle of Wagram.

A gap opened also between the infantry and the right wing owing to the first and second brigades having to incline to their left to grapple with Wallenstein's heavy masses, near which he himself was stationed. The second line cavalry of his left wing took advantage of this opening to attack the Swedish foot in flank. The situation was critical. To meet it the King moved from the right to the left of his wing, and finding the left regiment, the Smaland Horse, just come across the road, and their Colonel having been shot, replaced himself at their head and led them against the Imperial Cuirassiers.

A hot *mêlée* now ensued during which the King was killed. His horse was seen running about riderless. The Swedes were driven back over the road. As we are specially concerned with the King and his death the subsequent events of the battle need be only shortly noted.

The Swedish first line made a second attack, again achieved success, but were again repulsed on the arrival of Pappenheim who came up with the mounted portion of his command. Pappenheim shared the fate of the King of Sweden. Lastly, late in the afternoon the Swedish second line made a third attack carrying along with it what survived of the first line: of the Yellow and Blue brigades fully five-sixths had fallen. This attack of fresh troops was the decisive factor of the day. The enemy were driven from the field and the whole of their artillery captured. The losses on both sides amounted

to about one-third of those engaged. After the King's death the command had devolved on Duke Bernard of Weimar who was at first in charge of the left wing.

Of the exact circumstances of the King's death there is no sure knowledge: at the time of his last charge the mist again enveloped the field. Reports of treachery were bruited but have not gained credence. There is no reason to doubt that he died an honest soldier's death. After the battle his dead body was found under a heap of others. The Swedish historian Geijer states that this spot was forty paces distant from the present monument and was marked by an acacia tree. The tree is no longer there. The *mêlée* in which the King was killed seems to have taken place two to three hundred yards north of the monument. From the various accounts it seems probable that he was first shot in the bridle arm, and that he continued to ride his horse, and after unhorsed, was dragged, some distance from where he was first wounded.

His body was carried during the night to Meuchen church whence it was removed next day to Weissenfels and there embalmed by a chemist named Casparus, who found upon it nine wounds; five gunshots, three sword cuts and one thrust. His entrails were buried at Weissenfels and his heart was given over to his queen who came down from Erfurt. The body afterwards lay in state in the castle church of Wittenberg on the Elbe and during the following summer was conveyed to Sweden and laid in the Riddarholmskyrka, which is the "Westminster Abbey" of Stockholm, where it still rests.

The original memorial on the field of battle, known by the name of *Schwedenstein*, was a block of granite, a boulder of the glacial drift, which may have been borne hither during the ice age from the mountains of Sweden. It was, according to an old tradition, rolled to its present position after the battle by thirteen peasants from Meuchen under the direction of Erikson, the King's groom. Judging from old pictures it must have been much larger than it is now: it has probably been reduced by chipping for the sake of relics. We can quite understand that on reaching the road with its double ditch, the peasants could push it no further, and so it was left on the south edge of the road, where it has remained ever since. The only inscription on it was "G.A. 1632."

The stone so remained for two hundred years. Some Italian poplars were planted round it, and later on some benches were put, in a ring within the poplars. This must have been its condition when in 1813 on a closely adjacent battlefield Napoleon defeated with his young conscript army the hosts of Russia and Prussia, and, later on in the same year, past it filed the French army in their retreat from the disastrous field of Leipzig.

The bicentenary of the battle was the occasion of a proposal to replace the original stone by a larger monument of polished granite. This project was happily given up, and instead, a Gothic canopy of cast iron was erected over the old stone.

This was inaugurated on November 6th, 1837, in the presence of 30,000 people. On the canopy, on the side facing the road, is inscribed :

“ Here fell Gustaf Adolf the 6th November 1632.”

on the remaining three sides—

“ He fought the fights of the Lord ”

“ For God has not given us the spirit of fear without that of power, of love, and of discipline.”

“ This is the victory which has overcome the world, our faith.”

A grove of trees was planted behind the monument. Another festival was celebrated here in 1882, two and a half centuries after the battle, and latterly there has been yearly commemorations.

In 1894 to celebrate the tercentenary of Gustaf Adolf's birth, a drinking place was established hard by.

In late years the idea has manifested itself in Sweden of building a chapel on the ground, and in 1906 a certain Mr. Ekman resolved to carry out this pious project at his own expense. He chose a Swedish architect Wahlmann, and the first stone was laid on November 6th of that year with due solemnity.

The chapel is built of unsmoothed grey limestone, and is meant to hold some three hundred people. It stands behind the old monument, and is approached through a vestibule with a triple arch. Above this on the west or north-west front are two windows with stone sheafs of corn, the emblem of the Vasa family, this word in Swedish meaning “sheaf.” Higher up is a figure in high relief of Gustaf Adolf on horseback. This front ends in a battlemented turret, from which rises a copper lantern tapering into a long shaft surmounted by a cross.

At the inauguration on November 6th, 1907, there were present deputations of officers, non-commissioned officers and soldiers from the thirteen Swedish regiments that bear the battle honor “Lützen” on their colours. It is intended to enclose the chapel with a railing or hedge which will join on to the railing round the stone.

Mr. Oscar Ekman is a distinguished citizen of Göteborg,—better known perhaps to English readers under the form “Gothenburg.” He was connected with the Scotch firm of Carnegie & Co. and became head of their house in Göteborg, where he also founded a bank. He was generous benefactor of many good and useful works, a warm supporter of the Temperance movement, and one of the founders of the celebrated “Gothenburg system” of licensing. He represented his native city in both the Lower and Upper Houses of the Swedish Parliament. For thirty years he held the office of Russian Vice-Consul.

It was a happy thought of Mr. Ekman to erect this new and seemly monument to Sweden's greatest King, and it is sad to have to add that he did not live to finish this, his last work. He died in May 1907 in his 95th year. The work was completed by his widow.

All good soldiers, of whatsoever land, will unite in honouring this noble citizen who has thus raised a worthy memorial to one of the greatest captains of any age on the field where he found a soldier's death.

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ARTILLERY WITH INFANTRY.

BY MAJOR-GENERAL W. DU G. GRAY, C.B.

(A lecture to junior Officers of the Kohat Brigade, 31st March 1908.)

Artillery in the field is closely associated with infantry. It has indeed no separate existence like cavalry; for whereas cavalry finds its most characteristic rôle when working independently, or with Horse Artillery as an adjunct, the chief object of Field Artillery must ever be the support of infantry. Really decisive results are hardly ever achieved by either arm alone, and the co-ordination of the two is thus one of our most important studies.

Close association of the two arms.

Let us first consider the primary object of the fire of Field Artillery. It is not to breach earthworks but to prevent the enemy firing from them, or to make any given area untenable; as well as to destroy the enemy's personnel. In this picture you see shrapnel bursting before an entrenchment. Even if the man in the trench puts his head up, which is doubtful, he cannot make good shooting while the enemy's shell are behaving like that.

Object of Field Artillery fire.

Glance at it in passing from the point of view of the defender. We shall come to the effect of other projectiles later; but for the present let us note that shrapnel does little damage to the parapet. Hence, as the Manual of Military Engineering tells us, it is useless labour to make a breastwork to resist the shell itself. The enemy will try to burst his shrapnel above the trenches; and if he fires low will probably not hurt you at all. Your object is, therefore, to get concealment with merely such cover as will protect you against the bullets of shrapnel after the burst, and of course rifle bullets; but not to waste time and energy in making earthworks that will stop the shells themselves.

(What cover is necessary against it.)

At manœuvres we often see cover made much too thin at the top to stop any bullet. Every soldier should find for himself by actual experiment what thickness of different soils will stop his own bullet; and he should try the effect of ramming the earth. He must, too, provide head-cover to protect himself from the descending bullets of shrapnel. This is seldom done properly in peace manœuvres, but it is important. Sir Ian Hamilton emphasises the need of it in his "Scrap-book," referring especially to the case where the enemy's guns are of low velocity, as were the Japanese mountain guns. In the picture before you the trajectories are correctly drawn for Q.-F. guns, but the bullets fall, when the shrapnel bursts, at a much steeper

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angle than I have shown. This steeper drop is due to the centrifugal force which makes the bullets spread when the envelope is removed.

Hasty entrenchments will protect us against shrapnel, the projectile of Field Artillery. I will show you later that other kinds of shell make them untenable.

The comparative ranges of the two arms require study. Here is a table that differs considerably from that in Combined Training :—

COMPARATIVE RANGES.

<i>Limits for</i>			Infantry.	Q.-F. Guns.	Heavy Guns.	Mountain Guns.
			Yds.	Yds.	Yds.	Yds.
Long range	...	..	2,000	5,000	6,000	4,200
Effective	...	...	1,200	4,000	4,000	3,200
Decisive	...	...	700	3,000	2,500	2,000

In the first place I have, for simplicity's sake, only given the longer limit of each range; the figure below gives you the lower limit.

Then I have omitted distant ranges altogether. They can only be used on very special occasions; and even then, unless you have the most perfect confidence that you can use them well, are probably worse than useless.

And further, in the case of artillery, the ranges included as "distant" in Combined Training and Gun Hand-books are, in several instances, longer than the fuzes will burn. Fuzes can be produced to burn for such ranges, but you will presently see that they could hardly ever be used. So in my opinion distant ranges may well be left to the discretion of the moment and should never be reckoned on for normal work. History will, I think, justify this.

Then again, I have changed the infantry ranges. I believe most infantry officers will claim to be able to make their fire decisive at more than 600 yards; and will also admit that they cannot count on its being really effective at more than 1,200. These points are, however, for you to decide. The main thing is to remember how the ranges of your guns compare with those of your infantry, so as to combine the two to the best result.

In the Russian studies of their last war we find stress laid on the co-ordination of gun and rifle fire as a means of avoiding dead ground. This of course applies to the defensive in particular; but the principle is valuable in all operations of war.

Now to pass to the ranges of the new Q.-F. gun.

When I first began making notes for this paper I was told by two artillerists that the ranges given in Combined Training must

still hold for the new gun because the range is really limited by power of observation, *i.e.*, by human vision; and that what we had really gained in the quick-firer, as now evolved, was the maintenance of velocity, and therefore of energy, of the shell and its bullets. This is a great advance which we must not fail to note; but I found it hard to believe that improved sighting and fuzes, and the protection of the gunners by shields, and this maintenance of velocity, should not combine to make the fire of the new gun decisive or effective at longer ranges than its predecessor; provided always that such ranges were within the limits of easy observation.

I accordingly consulted other artillery officers, and I concluded that the ranges in the table before you, which I had already evolved from the range-table of the new gun, might be substituted for those in Combined Training, with the proviso that the actual effect of the fire must always depend on facilities for observation.

I must further emphasise the fact that everything depends on observation, both for ranging and for maintaining an accurate fire.

Observation of fire. The sights are graduated for sea-level in England on a calm day. But other conditions, such as altitude, season, weather and wind, make an enormous difference in the shooting. I may quote an instance of rounds fired from the same place with the same elevation on different days; on each day the shell all fell close together, but the difference of range between the two days was nearly 500 yards. Therefore, however mechanically perfect the gun may be, its capacity for accurate fire practically depends on the power of observation of the battery commander.

Altitude, wind and other conditions, we know, affect the rifle bullet too. There is this difference to be remembered—that the shell of the new gun preserves its velocity, and therefore its power and accuracy, during its flight in a quite phenomenal way; whereas, in the case of the rifle bullet, these functions diminish rapidly.

There are other difficulties that beset observation besides distance. Some such are—light; background; marshy ground swallowing up shell; undulations of ground concealing their burst; and so on. For any of these reasons observation may be easier at longer than at shorter distances. It may be easy at 5,000 yards and extremely difficult at 2,000; and again, on the same ground and the same day, ridiculously easy and almost impossible.

Assuming however that all conditions are the same, difficulty of observation increases with the range; and usually becomes very great at 5,000 yards.

So we must always look on any such table as this as a purely arbitrary scale for convenience of comparison; and remember that the actual fire-effect depends more on facilities for observation than on range.

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An instance of human vision restricting fire is found in the battle of Colenso. When the Boers evacuated the trenches at the foot of Fort Wylie and climbed its slopes, our naval guns took them for a British assaulting party and ceased firing.

Now we must not think that when one arm is in action at any given range the other can only appropriately fire at the corresponding range in the table—my table or any other that you accept. Rouquerol, the leading writer on modern artillery tactics, is very insistent on this point, and so is Prince Kraft. Rouquerol says that guns will occasionally support the infantry from long ranges; at other times they will be literally shoulder to shoulder with the firing line. All agree that they must push in to the most dangerous ranges when they can better support the infantry by doing so.

Of course you will always take advantage of the superior range of your guns unless there are reasons to the contrary. The essential thing is that the co-operation of the two arms be uninterrupted.

In the Prussian invasion of Austria in 1866—the “Seven Weeks’ War”—the German artillery did not back up the infantry closely and so lost their confidence, as Prince Kraft relates. But they showed in 1870 how they had profited by the lesson. Their splendid co-operation was one of the leading features of the war. You may study the conduct of the guns that crossed the Mance Ravine at Gravelotte as a good instance.

(Time will not allow of my giving full accounts of examples, but I shall quote as many as possible to help you in following up the subject.)

In the final assaults at St. Privat the German guns advanced right into the line of skirmishers, and the same occurred at Sedan and Spicheren and Vionville.

Again at the battle of Liao-yang, a Japanese attack was brought to a standstill by the fire from the Russian trenches on the evening of the 2nd September 1907. At daybreak, when it was resumed, the Japanese guns moved within the zone of the Russian rifle-fire and bombarded the position till dark. The Japanese infantry had now crept to between 200 and 300 yards from the trenches; and a fierce fire from the guns gave them the clue to advance.

So we see that artillery must, to carry out their chief duty—the support of the infantry,—be prepared to face heavy loss. And we must remember that they can lose 50 per cent. of their personnel and still remain about as effective as when at full strength—quite different to infantry.

FIRE-EFFECT.

A few words now on fire-effect.

What characterises that of the quick-firer is the power of bringing overwhelming destruction on any area where older guns could only fire with deliberation and uncertain results; and it is probable that this power will make the action of artillery in battle always a very material one, instead of its effect being at times largely a moral one as hitherto.

What characterises the fire of Q.-F. guns.

This power is further enhanced by improved fuzes, ensuring more accurate fire; by increase ranges; by better maintained shell velocity; and by the protection of the gun detachments by shields.

For the present I will only refer to the fire-effect of the new field gun; we will take that of other classes of mobile ordnance later.

A very characteristic and demoralising effect of the quick-firer is attained by searching fire—the rafale of the French. This means a rapid series fired at a range increasing by 100 yards every other round; or with guns having different elevations; so that a considerable depth of ground is covered by shrapnel bullets.

At Yoshieri, on the 31st July 1904, some Russian guns on one occasion opened a terrific fire on the Japanese artillery, for 10 minutes, at a range of between 3,000 and 4,000 yards, and compelled the gunners to take shelter. Apparently the Russian guns were not their latest pattern, but the instance suggests the annihilating power of the artillery that first gets the range and fuze; and with more modern guns this power must be still more marked.

As the demoralisation of troops is proportionate to the suddenness of their losses, as well as to the severity, it is obvious that a searching fire may be very effective if ranges are registered beforehand; because the storm of shrapnel then comes as a surprise. For this purpose, unless the guns have fired before, the range must be found by some other means than trial shots, or there would be no surprise.

Let us all take a lesson in passing. It is not enough for infantry to get into an invulnerable formation when the enemy begins to shell them. They must be in it already when they pass any ground where a rafale may strike them, or the shell-storm may do its work before they can extend.

A digression: How can infantry advance under it?

Scouts will not help either; indeed unless very skilful they may warn the enemy of the advent of the infantry.

Guns would not, I need hardly say, waste rounds in searching any given area unless a more or less formidable body of the enemy were known to be there. Indeed though the rafale can be terribly effective, and was actually used effectively by the Japanese at times, it is hardly possible it can ever be general because of the enormous expenditure of ammunition it entails.

Its limitations.

The search or rafale brings out another feature of modern artillery fire, viz., that it is characterised by lulls.

Lulls.

As you are all aware, replenishing ammunition is one of the chief difficulties in war. It becomes more than ever a difficulty when we are liable at any moment to use a very large quantity; and therefore ammunition must be husbanded more carefully than ever. Whence the lulls.

Deliberate fire is still necessary and must always remain so. The

Deliberate fire.

reasons are quite plain. There is the moral support that friendly shells give to our own infantry; and the depression of the enemy's morale; and the urgent need of making the troops in any trenches you are attacking keep their heads down. (See picture.)

Lulls and deliberate, often desultory, fire were features of the last war; but we must draw lessons therefrom with caution, because the use of the quick-firer was then tentative and inconclusive; the guns new and the gunners unused to them. The Russians have written a good deal about what they learnt; but their experiences were entirely of the defensive.

Lulls must not be allowed to deceive us. The enemy's guns may

Lulls not to deceive us.

be there still, the detachments taking shelter from our fire close by ready to trouble us again directly we let them. This occurred at St. Privat and elsewhere in 1870, and was instanced again and again in the late war and also in the Boer war.

(You will not overlook the difference between thus temporarily silencing an enemy and destroying him.)

We have seen the usual fire-action of field guns against infantry in trenches. Now let us take other targets.

TARGETS OF FIELD ARTILLERY.

If infantry is moving in the open the Germans fire on the most

Infantry on the move.

advanced line unless any bodies behind offer a better target. Our F. A. T. Manual lays down, as a broad principle, that artillery should fire on whatever hostile troops are at the moment most menacing, but admits that the head of an advancing attack must be the target.

Another lesson here in passing. Think out how to get over such ground. The width of the cone of

Another digression about infantry advance under such fire.

dispersion of shrapnel will give you a clue to intervals between bodies of men, and the smoke and dust of a rafale that has burst harmlessly may provide cover from view under which you can run forward.

To quote again from the battle of Colenso. In Hart's Brigade,

Colenso.

at one time, companies were met with a terrific fire whenever they got up to advance. And a squadron under Lord Dundonald, advancing dismounted, was obliged to lie down by a volley at 600 yards. The Boers at first thought them annihilated, but whenever they tried to rise re-opened

a vigorous fire. Even their retirement could not be carried out for some two hours, and then only with severe loss.

This instances "registering" zones. Much of the fire was in these cases small arm; but the fire tactics are strictly analogous to those of Field Artillery.

A word about projectiles.

Whenever guns are directed against man or horse the projectile is time shrapnel; and this, at short ranges, is more or less independent of exact ranging.

When guns are engaging guns the shield that now protects the detachments forms a new factor. It will require the use of percussion shrapnel, or perhaps H. E. shell if available. Experiments with other shield-piercing projectiles are in progress.

**Targets (continued)
Guns.**

Artillery is, of course, most vulnerable when limbered up, and especially when coming into or out of action. This fact will govern their own procedure when coming into position, as well as that of their opponents in firing on them. The greatest attention is paid to concealment of horses when guns are in action.

Cavalry is a moving target and can usually only be successfully shelled at ranges previously "registered," i.e., when crossing areas of which the range and fuze have been determined beforehand. Cavalry attempting to charge a battery of quick-firers in front would be very severely handled. Even a charge on a flank could probably be met by swinging round the trails of a few flank guns.

Cavalry.

To turn an enemy out of a village, field guns would try to set it on fire. Percussion shrapnel is said to be a very good incendiary. You would use H. E. shell to destroy the walls if you had heavy guns or howitzers to hand; but the H. E. shell is not so good an incendiary as the percussion shrapnel.

Villages.

We now come to the question of cover for artillery in action. Guns, like infantry, should be protected from fire whenever it may be feasible without sacrificing fire-effect. Indirect fire and the shields of our new guns illustrate this. But it is a subject I cannot wait to enter into now except to note two facts.

COVER FOR GUNS.

First, that, where natural cover does not exist, pits or epaulments are all but indispensable when time allows of their construction; though earthworks, of course, give the enemy distinct points to range on.

Two special points.

And you will note, in this connection, that shields make guns much more conspicuous.

And, secondly, that cover from view is necessary if full advantage is to be taken of smokeless powder. Guns must be at least 15 to 20 feet below a crest to be properly hidden. If the ground or trees do not provide such cover from view the flash, and the dust thrown up in front of the muzzle by the concussion of the discharge, will

give the position away almost as much as the old smoky powder did. Such devices as watering the ground and spreading tarpaulins or sacks, to keep the dust down, are resorted to.

The action at Aiyumon, on 22nd June 1904, and that at Yushulin on 31st July 1904, provide studies in the use of cover for artillery. Also Kyoto on 8th and 19th July 1904, where the Russians provided spare gun-pits, the guns moving from pit to pit.

You will of course realise that until we have smokeless blank charges we cannot simulate war conditions at manœuvres. Such makeshifts as black powder or puffs are entirely unrealistic, and we must be careful not to let them mislead us into any false conclusions.

BLANK CHARGES AT MANŒUVRES.

I have endeavoured to clear the way thus far without trespassing too much on technicalities. Now let us pass to our real work—the tactical use of guns with infantry. This is everybody's business. We will take it in the sequence of events.

TACTICS OF GUNS WITH INFANTRY.

First, then, the position of guns on the march. There are occasions when you will obviously be unable to use your guns early in the fight (for instance, at night) when artillery would be put in rear of the column.

Guns on the march.

Order of march must be adapted to prospective requirements.

(The arrangement of your order of march is always a matter to be carefully adapted to the conditions of the fight in prospect.)

So usually artillery is put as much to the front as is consistent with its safety, because normally the whole of it would be brought into action in the early stages of the fight.

Usually well to the front.

The other arms provide it with the necessary "manœuvre zone" within which it can come into action without undue exposure. When the manœuvre zone is no longer provided by your original dispositions, the special escorts, with which you are familiar, come into play.

Their duty, as Combined Training tells us, is to keep the enemy's skirmishers beyond effective range.

Curiously enough, the Germans have a strong tendency to abandon these special escorts altogether.

Here we must remember that the protection of guns, until they are ready to open fire, has become more imperative than ever now that the enemy's quick-firers can annihilate them, as they come into action, before they can retaliate.

The position of reserve ammunition on the march has also become more important because rapid expenditure may at any moment deplete the supply to hand. Our Manual prescribes that a day's supply must be within easy reach

Ammunition columns on the march.

The advance guard is furnished with guns according to prospective requirements. The guiding principle is that they must be strong enough to prevent interference with the advance and deployment of your other troops.

Advance guard, how many guns for.

We may now suppose you to have made contact with the enemy. We find there is a radical difference between the use of these advance guard guns and those of the main body; for when the latter become fully engaged the Commander is committed to the fight, and that is just the result which advance guard action must not produce without specific orders.

Action of, not the same as that of artillery of main body.

The advance guard artillery is restricted to covering the movements of the troops behind. Its positions are chosen with a view to the deployment, subsequently, of the batteries of the main body. (This does not, however, imply that the latter necessarily come up alongside; because the enemy will probably have the exact range by then.)

Advance guard artillery should mislead the enemy as to its strength, and must save itself as much as possible because on it depends the successful deployment of the main body. For these reasons dispersion of guns is sometimes appropriate.

Is dispersion appropriate?

As the action of an advance guard is so full of importance to the battle to follow, its artillery must not open fire without the express orders of the Advance Guard Commander.

The conduct of the artillery in this phase is one demanding much discretion and is typical of that of the advance guard generally.

After a preparatory phase, during which your endeavour is to make the enemy show his hand, the engagement develops; and your first need is a position or positions for all your guns.

The developed fight.

You will find in the Manuals a good many points that an artillery position should have. As a rule they are a matter of common sense, and the only one I shall refer to now is that the ground should admit of the guns coming into action unobserved. This is a corollary to what we have noted before both about surprise and about the vulnerability of artillery not in action; and the quick-firers of the enemy enhance its importance.

Artillery positions.

You will, in reading, observe that the Manual does not put a road for retirement as one of the points of an artillery position. Prince Kraft, in his tenth letter, is eloquent in favour of disregarding any facilities for retreat.

Closely connected with the selection of a position is that of indirect laying, or indirect fire as it was formerly called. This means that the guns are brought into action behind cover. It has the advantage of concealing the position of the guns as well as providing cover from fire; and it

Indirect laying.

eliminates much of the personal error of the layers; but many officers believe that to get the full power of the guns, at any rate in the critical stages of the fight, you must lay direct over the sights; and the experience of the Russo-Japanese war seems to confirm this. They do not point to any definite conclusion, otherwise, on the subject; and the decision to employ this method must rest with the circumstances of the moment.

In indirect laying fire is controlled by the Commander, by the use of two instruments, the director and field plotter. We cannot wait to study this most interesting subject now. You may read about it in para. 56 and Appendix I of the Manual of Field Artillery Training. And, as an instance, read about the Japanese failure to find the Russian guns at Ta-shi-chiao.

Every gun you have must now come into action to cover the advance of your infantry; and to let the plan (which you have now carefully evolved) take effect. You want to establish superiority of fire, and you cannot risk any of your guns being beaten in detail. Therefore you send every gun forward now. And this leads to the question of massing and dispersion, which has received much light lately.

You are doubtless all familiar with the German partiality for massing guns, and the perfection to which they brought the system in 1870. The battle of Sedan is a classical instance. The object is to facilitate command and the control and concentration of fire; and to overwhelm the enemy thereby. But there has been a good deal said lately in favour of dispersing guns—to enable them to seize opportunities; to give less mark; to favour initiative; to get converging fire; to enfilade shielded guns; and so on. Or again there may be no suitable position for massing. Our Field Artillery Training Manual is clear on the subject. It tells us that though concentration of guns, to obtain superiority of fire, is as valuable as ever, dispersion may be necessary owing to the wider front occupied by modern armies; to the great sweep of turning movements; and to the increased need of concealment. And it explains that concentration of fire, though formerly impossible with dispersed guns, can now be attained because of our improved appliances; but that a very high standard of efficiency is indispensable if we are to get full value out of widely dispersed guns. The appliances in question are the field plotter and the director, of which I spoke before, assisted of course by signalling and the telephone.

As dispersion favours the seizing of small opportunities it suggests itself for irregular warfare in particular

Before leaving the question of dispersion let me remind you that it must never go as far as employing guns singly. This was done at times in the Boer war, but it is not sound because half the guns so used would be without officers, and replenishment of

Ta-shi-chiao.

All guns are used to open the battle.

Massing and dispersion of guns.

Sedan.

Where dispersion must stop.

ammunition would also be more difficult than ever. And to split sections is to upset the whole organisation. Prince Kraft is emphatic. He says "A single gun is no gun at all." For the same reasons half batteries are not admissible, except when the battery consists of four guns. Ranging, too, cannot be done with a single gun, and takes much longer with a section than a battery.

Kyoto.

When you look up the battle of Kyoto, note also the dispersion of the guns in the Russian position.

The Japanese were good at collaboration of dispersed groups of guns; though, as you know, their inter-communication was defective as they did not employ visual signalling. We have a good start in this matter if we choose to make use of it.

We have seen that the guns open the battle. It has long been the fashion to talk of this artillery duel as a distinct phase, and the Germans still seem

The artillery duel.

to do so. Rouquerol, however, argues, with much force, that there is no such distinct phase. He says that artillery fire is always but a means to an end; and that the so-called duel merges into the general fight. And the experiences of the late war tend to confirm this. The point is more of academic than of practical interest, but I mention it that you may be in possession of the latest views. Whatever may be the correct way to describe it, in most cases the first phase to follow the full development of the situation will be a struggle between the rival guns to establish such a fire superiority as to enable the infantry fight to start. You may study the question further in section 85 of the F. A. T. Manual, and in accounts of the Russo-Japanese war.

I must now enlarge a little on what I told you about the co-operation of guns with infantry when speaking of the relative ranges of the two arms.

Changes of position.

In helping the infantry it is often necessary for the guns to change their position.

But remember that a few hundred yards' variation of range makes no practical difference to guns. And while changing they are useless.

Changes should usually be concealed from the enemy, both to ensure surprise, to prevent the enemy forestalling you, and to let the move be made in safety. Such moves should be carried out by echelons, *i.e.*, under the protection of guns still in action. The last war shows that we may often have to wait for night to move guns.

The Japanese appear to have usually provided cover, and artificial concealment, ahead for their guns; and to have seldom changed their position by day; but, when they did so, the guns dropped at

Liao-yang.

once into gun-pits previously prepared. Liao-yang will give you an instance.

At Sedan three French batteries, endeavouring to change position from the Fond de Givonne to near the Bois de la Garenne were annihilated, one after

Sedan.

the other, before they could fire one shot.

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So guns should not change position unless there is no doubt about the advantage to be gained. But the F. A. T. Manual countenances small changes with the object of getting more effective fire; and history gives us instances of useful changes of as little as 200 or 300 yards.

The German Regulations will elucidate this. They say that is undesirable that infantry should fight side by side with artillery, and that it must not be drawn into direct participation in the artillery combat; that it must be so far in front that the guns are protected from hostile effective infantry fire. This latter provision will not, as I have shown you, always meet the necessities of the situation, and it is not in accordance with the spirit of Prince Kraft's teaching. (Incidentally it suggests a reason for the German inclination to abandon special escorts for guns.)

I will give an instance from history, at the conclusion of my lecture, which will illustrate changes of position among other things.

Disengaging guns not always easy.
Woerth.

But meantime let us note that it is not always easy to disengage guns once they are in action. At the battle of Woerth, on 6th August 1870, the German turning movement against the French right had to advance without artillery; as the guns had been engaged at Gunstett Hill and could not be extricated. The consequences to the Germans might have been serious, but it happened that the French had little artillery with their right.

Why guns are not held in reserve.

Let us consider now why it is not usual to have an artillery reserve.

Guns, the Manual tells us, are not to be ordered into action

In observation.

without an object. They may be "in observation," i.e., watching ground and ready to open fire, either in concealed or visible positions. (The latter are objectionable as the enemy can locate them.) Or they may be in

In position of readiness.

"position of readiness," i.e., under cover but with their actual positions reconnoitred and determined, all preparations made and look-out men watching the situation.

But they are not, as in the days of Napoleon, held in reserve: and the reason is that artillery now comes into action at such long ranges that it is not thereby let out of hand, and can easily be moved; we have seen, too, that you want every gun at the front.

Batteries should come into action as nearly at the same time as possible to avoid the risk of being crushed in detail and to gain the advantage of suddenness and surprise. The instance I have quoted of the destruction of three French batteries at Sedan partly illustrates this among other principles.

If you are inferior to the enemy in guns, one of the courses you may pursue is to conceal them from his artillery, retaining them to combat his infantry. The alternative might be an

Conduct of over-matched guns.

unequal fight involving the destruction of your guns. I note this principle with a certain hesitation as it might seem to excuse want of enterprise and forwardness. But it is one that, handled by a man of action, may be very useful; and to show what results may be achieved, in very exceptional cases, without guns, I may remind you

Shipka Pass.

of the passage of the Shipka Pass, in the Balkans, by the Russians in January 1878. The winter was severe and the snow so bad that the guns could not even be moved on sledges. Only one battery of mountain guns accompanied each column, and the historian of the war (Greene) relates that "these little guns amounted to nothing."

Again at the Yalu we are told that the Russian guns might have advantageously withdrawn to the higher

Battle of the Yalu.

hills in rear, out of the Japanese range, and might still have covered the Yalu and Ai-Ho and the intervening islands with shrapnel.

We must not confuse this tactical principle with the conduct of batteries which have exhausted their ammunition. For such, our regulations prescribe that they must remain in action until fresh ammunition has been brought up. And Prince Kraft enjoined the same with his usual emphasis.

Conduct of guns whose ammunition is exhausted.

It is most necessary that your artillery commander should thoroughly comprehend your plan and intentions, for only thus can he co-operate with your infantry to full advantage.

Co-operation how possible.

Firing over the heads of infantry.

With regard to guns firing over the heads of their own infantry.

It is dangerous under 1,500 yards. At longer ranges the infantry should be safe at 600 yards from guns or target. With heavy guns this would be 800 yards. The Germans say 330 yards for field guns, but the German Regulations sometimes indulge in heroics.

This gives you a clue to the distance over which you *may* have to carry the final assault of infantry without help from your guns when the latter cannot act from a flank. I say *may* purposely, because we must remember that, if our guns cease fire at such a juncture, it means the withdrawal of their support at the supreme moment when it is most needed; and I think infantry soldiers will say, with Rouquerol, that it is better to risk a few friendly shells than the hostile fire from the trenches.

(A digression. Supporting the infantry assault.)

It seems that guns must come up to close range, say 2,000, and they should then be able to shoot accurately enough to cover the attack to within 200 yards at the most.

This is a point that our manœuvres ought to illustrate, especially as inter-communication between the two arms is, above all, necessary at this phase and it must be good and rapid, simple and with a minimum liability to error; all of which means plenty of practice by both arms together.

In the attack on the village of Zookaton, in the battle of Mukden, the Japanese advance was brought to a standstill. The corps artillery galloped forward, under heavy fire, for about 2,000 yards, coming into action at some 1,800 yards from the village. These guns then covered the infantry advance to within 400 yards.

It is not correct, theoretically, for the guns to cease fire, in an attack, when their infantry are assaulting. They should really continue, if possible, but at an increased elevation, so as to hold fast the enemy's reserves. All this is very difficult in practice, but this only emphasises the need of familiarising ourselves with it in peace.

Let us now go more into details of the attack. When guns accompany an infantry attack, Rouquerol says that it will be necessary for some batteries to advance to within decisive artillery ranges. We have already touched on this point. It is upheld by our F. A. T. Manual, and by the experiences of the late war; and the Germans recommend it. The gain to morale, says Rouquerol, will compensate for the artillery losses, and such batteries would be under the protection of others in rear. Of course they would be much more vulnerable than the infantry they accompany, unless the ground were very favourable or the moves made in the dark. But artillery can suffer a relatively much higher loss than other arms before they become ineffective.

But when Rouquerol speaks of batteries in the attack "halting for a moment to deliver a few rafales, and then rejoining the infantry almost without losing touch"; and of infantry in the attack taking only 20 minutes to get from 2,200 to 500 yards (from the enemy's position); I think we had better fall back on the more sober teaching of our own Manual (F. A. T.), which, while laying the greatest stress on co-operation between the two arms in the attack, only ventures on general principles; and deprecates risky changes of position except under concealment or cover of darkness. And this indeed is the teaching of the last war. You will do well to study, on this subject, section 85, F. A. T.; and read all the instances you can find in history.

Another, and quite novel lesson of the Russo-Japanese war is the use of artillery fire at night, both in attack and defence. You must look for instances for yourselves in accounts of the latter part of the war.

I shall not enter into more detail of attack. To me it is obvious that we cannot hope for proficiency in combined attack by the two arms, which should be an essential part of our training, until we practise it under more real conditions, *i.e.*, when the guns are firing live shell. The opportunity is afforded by every artillery practice camp.

What we have yet to systematise is a means of inter-communication between guns and firing line; and I need hardly note that, when we have evolved a method, it will require much practice by all, under the most

Inter-communication.

realistic conditions we can get. Any troops that have not had such practice will be heavily handicapped in war.

The Japanese artillery supported their infantry admirably as a rule. How much easier then for us to establish a system, with our visual signalling already so advanced.

We should take too much time were we to go into details of pursuit. I will only now remind you that your guns must act with great boldness.

Pursuits.

In the occupation of a captured position, the conduct of guns must depend on local conditions. They must get, as quickly as possible, to points

A captured position. from which to hold the position against attempts at re-capture, or to shell the retreating enemy, if they are not already able to do so.

Griepenkerl gives you many illustrations.

Summary of functions of guns on the offensive.

The functions of Field Artillery on the offensive are thus:—

First, to assist in covering the deployment of the main body. This is the advance guard work.

Second, to establish superiority of fire over the enemy's batteries, the so-called artillery duel. This is where the question of massing comes in.

Third, to support the infantry attack.

And, lastly, to confirm their victory or cover their withdrawal.

The defensive.

We now come to the defensive.

The guiding rules for the defence of a position are found in Combined Training. They are, as in the attack, the attainment of superiority of fire, and the counter-attack—everything being, of course, adapted to the ground.

The defence of a position.

The counter-attack is the main thing, for I hope and assume that you will never attempt a passive defence. You would seal your own defeat if you did.

The counter-attack.

Take your counter-attack, then, first as the soul of your defence. You want to strike as hard as possible. You cannot therefore do better than counter-attack exactly as you would attack.

It is very necessary that your troops in position and your counter-attack should co-operate to the fullest extent. They should not mask each other's fire or in any way hamper each other.

You would put in the position only as many guns (like other troops) as may be actually necessary, to

The position.

leave as strong a force as possible for the counter-attack. But you do not put the remaining guns in reserve. They are so mobile that they can be held ready to play either part that may be required.

The guns of the defence have this advantage over those of the attack, that they can be in action the whole time; while those attacking them are useless while they advance from one position to another.

We have already dealt with the targets for guns. There is another point to add here, with special reference to the defence of a position. You must lay over the sights to fire on advancing infantry, because there must be no dead ground; and you cannot have that condition if your shell have to clear crests

Is indirect laying suitable?

At what range ought fire to be opened on the attacking enemy?

Long or decisive ranges.

You may elect to fire at long ranges and so delay the enemy, or to reserve your fire for critical moments and decisive ranges. Do not leave the responsibility of the decision to "the man on the spot." It is your business, therefore think it out and give clear instructions.

I do not say that you are in any way to stifle initiative, but that you are to see that all under you understand what is to be the character of your defensive action.

One object of firing at long ranges is to make the enemy disclose his artillery. On this subject, generally (*i.e.*, not as restricted to the defensive), you will find Prince Kraft's twelfth, thirteenth, and eighteenth letters full of instruction.

An object of long range fire.

Retirements.

We now come to retirements.

Rear guard, how many guns for.

In telling off a rear guard, remember that, as its work is to gain time, it must be strong in guns.

In rear guard work artillery takes a prominent part because it can delay the enemy a long way off. By taking up positions wide on the flanks it can do much execution, and such wide movements are the more necessary from the fact that the pursuit will most probably threaten the flanks.

Principles for.

Of course in *these* positions there must be an easy road for withdrawal. And they must obviously admit of long range fire.

Positions.

The guns must be strongly escorted by cavalry or mounted infantry, and in every retirement they must be careful not to mask your other rear guard troops.

Escorts.

Combined Training has a very pertinent rule to the effect that successive positions along the line of retirement should be so far apart as to induce the enemy to form up afresh for each advance, and the F. A. T. Manual also lays stress on this principle.

You must carefully preserve your rear guard batteries from infantry fire, because if their horses are killed they lose their mobility. This is quite a different principle, you will observe, to that of the attack.

Most of these matters will depend on the initiative of your battery commanders, but you are the responsible man.

Retirements are the most difficult of all manœuvres and demand much more practice than they get.

Guns are sometimes put on outpost work, but there are extremely few occasions when they can be so employed to any useful purpose. Do not, therefore, send them on piquet without some very clear reason; but send them into camp and nurse their horses to the utmost of your power.

Combined Training makes some general suggestions, such as holding a defile; but the use of artillery on outpost duty can only be justified by very special conditions.

Other mobile guns.

I will now very briefly touch on the chief characteristics of other mobile guns.

Mountain artillery is nothing but field artillery that can climb.

Mountain artillery: Its characteristics

It has naturally a lighter projectile, and a shorter range, than the "field" gun (see the table); but though the latter will outrange it when on equal terms, it has the advantage of being able to come into action where "field" artillery cannot even move. It is, therefore, not to be kept for irregular war only; but is often, as the Japanese found, of the greatest value against a civilised foe.

Howitzers fire powerful projectiles with a steep angle of descent; and hence are specially suitable for attacking

Howitzers.

dead to other weapons.

Their characteristics and special uses.

The uppermost shell in the picture is intended to represent a howitzer time shrapnel descending at its steepest angle. The gentleman in the trench is even less comfortable than he was before.

The angle of descent is up to 45 degrees or $\frac{1}{2}$ and it must be not less than 30 degrees or the fire will not

Trajectory, limits of.

be effective.

H. E. shell are fired as well as shrapnel.

Should not be exposed.

Howitzer fire requires careful preparation; so you would not push them forward so as to expose them.

They would not usually be wanted early in a fight, and therefore you need not put them near the head

Position on the march.

of a column on the march.

Frequent changes of position are inappropriate because of the time and care required to find the correct

In the fight.

charge and angle.

The range is, of course, considerably less than that of field artillery.

The use of a H. E. shell makes the howitzer especially useful for breaching walls; and this property, com-

With a cavalry raid.

combined with their superior mobility as compared with heavy guns, is what de Negrier refers to when he says that they would be invaluable with cavalry on a raid.

The howitzer was re-introduced, after long disuse, when the work for which it is adapted was found impossible with the flat trajectory of the modern field gun.

Howitzers were very effectively used at the battle of the Yalu by the Japanese. It will be worth your while to study this instance. (And it also illustrates the control of batteries by telephones from observing stations.)

The use of the heavy gun as a mobile field weapon came in during the Boer war. Its special rôle is to do what guns of less weight cannot do; and this will include covering the advance and retirement of the latter. Its fire is of great value against buildings and entrenchments.

Heavy guns.
Characteristics and use. It is characterised by a much heavier shell and longer range than the ordinary field gun, and by its H. E. shell. This last advantage it shares with the howitzer.

The radical difference between a lyddite (or other H. E.) shell and shrapnel is that it retains its full destructive power to the end of its flight. Shrapnel bullets are impelled almost entirely by the remaining velocity of the shell when it bursts. Hence, generally, the longer the range the less their power; though with the new Q.-F. gun velocity is maintained in an extraordinary way. But the H. E. shell works destruction by its fragments; and the burst is the same at any range.

It has also a much wider cone of dispersion, indeed its dangerous zone is "all around," but the splinters are light and the effect only local.

Heavy guns can only manœuvre at a walk. They are too heavy, and too liable to upset, for any faster pace. So they must not be exposed like more mobile guns.

Pace of.

The full range is 10,000 yards; but remember that the power of observation limits the range in the same way as with other guns, though of course

Range of.

the burst of the bigger shell can be seen at longer ranges.

This long range will gain you much time, especially valuable on the defensive.

The massing of heavy guns with quick-firers in attack may at times be advisable in order to break down defences and to spread demoralisation.

Massing and dispersion.

But, as pointed out in the Manual of F. A. T., the enfilade and cross fire, for which their ranging powers adapt them, indicate that they may often be best used dispersed.

Being of such value, these guns should march where they are readily available, near the head of a column in advancing, near the tail in retirements.

Position on the march.

Unsuitability for rear guard work.

You will have inferred that they are not mobile enough for actual rear guard work.

If you ever have the handling of heavy guns, remember all their advantages and that you must not expose them unduly because of

their comparatively inferior mobility. But also remember that their long range is in itself an element of safety.

Following May—an instructive writer, but whose books on artillery were written before recent developments of materials—let us consider the vulnerability of the new shielded gun when in action.

Long ago—long before shields were brought in, and when guns were very inferior to the present type—Prince Kraft proved that artillery could hold its own against an infantry frontal attack. Let us see how our own gun stands in this respect now.

It requires percussion shrapnel to penetrate the shields, and the Manual (F. A. T.) states that good effects may be expected against men behind the shields if direct hits are obtained. This means very accurate ranging.

I am speaking, of course, of purely frontal fire.

With time shrapnel and rifle bullets you will not damage the shields.

The gun detachment consists of ten men, disposed thus:—

No. 1, who commands the gun, and Nos. 2, 3, and 4 are behind the shields, so you cannot touch them. No. 10, who is in charge of the wagon (along side of the gun), is behind the wagon; and so are Nos. 5 and 6, who set fuzes.

Nos. 7, 8 and 9 are reserve men and are also behind the wagon.

Out of these ten men, under such very good cover, you might thus kill three, and still leave the gun with the full number to work it, as there are three in reserve. But the gun can be worked by three men only, so you would have to go on and kill five more before you finally put the gun out of action.

Of course you may catch men carrying ammunition to the gun from the wagon, but there are only about six inches between the two—(see diagram, page 200, F. A. T.). (Note the wagons also have shields.)

You will decide for yourselves whether it is work for sharpshooters. But do not think, as we were taught of old, that no guns can exist under infantry fire, or that you will disturb them much with any rifle fire you can bring on them from the front.

In spite of shields, artillery is very vulnerable by oblique and enfilade fire, and by all projectiles but time shrapnels and rifle bullets; and that is why such cover as gun-pits is necessary.

More about projectiles. Let me, before closing, say a little more about projectiles.

The cone of dispersion of modern shrapnel, *i.e.*, the spread of the bullets when the shell is burst by a time fuze, is about 20 degrees at 2,000 yards. It increases with the range, and, at 6,000 yards, is about 27 degrees.

At extreme range the angle of descent of Q.-F. shrapnel is nearly 40 degrees; and the forward effect (*i.e.*, the distance to which the bullets, after the burst

Forward effect.

Cone of dispersion.

of the shell retain enough striking energy to "put living targets out of action") is naturally much diminished. At 2,000 yards the forward effect is about 320 yards.

Thus you see that the curve of the trajectory diminishes the forward effect. When I said that time shrapnel was, at short ranges, more or less independent of exact ranging, I referred to this fact; and meant to imply that the longer the forward effect the greater the margin for inaccuracy in ranging. Of course, too, "as the distance of the burst short of the target increases, the density of the hits diminishes."

At any rate ranging must be exact at anything but short distances.

At extreme range shrapnel bullets have, at burst, much more striking energy than is needed for their amiable purpose, and they retain enough up to 200 yards.

The splinters of a H. E. shell, burst in the air, would descend almost vertically. This follows from what I said before. We are told to observe the same precautions in firing them over the heads of infantry as in the case of shrapnel.

To search the interior of a work with a H. E. shell, endeavour would be made to burst it on the crest of the parapet

Just to give point to my remarks let me conclude with an instance from history. Gujrat is a good one and we might take many from 1870 or the last war. I have selected the action

All illustration of co-operation of the two arms.

Elandslaagte.

of Elandslaagte on 21st October 1899. It does not illustrate more than a few of the principles we have discussed, for many of which you must look in the fields of the future; but it does illustrate the one principle without which all others are but battling the wind—the co-operation of the two arms.

The Boers had occupied Elandslaagte to cut off Glencoe and Dundee from Ladysmith (Ladysmith to Glencoe and Dundee N.-E. about 40 miles, Ladysmith to Elandslaagte 14 miles).

General French was sent from Ladysmith to restore communication.

A reconnaissance was made from the west of Elandslaagte (X on map). French's guns (Volunteer muzzle-loaders), firing on the station, at once drew the fire of the enemy's guns 5,000 yards off.

Some further information, gleaned from inhabitants, enabled French to report the result of his reconnaissance. He withdrew to the Modder spruit, and by 3 P.M. reinforcements from Ladysmith brought up his strength to 16 companies, 8 squadrons, and 3 batteries. (The two new batteries were field artillery.)

The enemy was posted on a ridge (see map) steeply ending on the north; with an undulating plain, and a clear field of fire, to south and west. They had advance posts on front and flanks.

A squadron was sent forward from the right to drive in outposts, to enable a position on the enemy's flank to be secured, and

to reconnoitre towards Dundee whence Boer reinforcements were expected.

General French's plan was to hold the enemy in front with one battalion while attacking his left. The field batteries were to prepare the assault from between the two attacks.

Two squadrons and a battery drove in the Boer post north of the railway and located the enemy's right. (The infantry attack was commanded by Colonel Ian Hamilton.)

The batteries opened fire about 4 P.M. at 3,800 yards ("a" on map).

The Devonshires, on the left, waited under cover until the flank attack came under the enemy's notice; and then, preceded by scouts, advanced to the attack. The supports, extended, were 350—450 yards behind the firing line. The reserve was in company columns, at 50 yards' interval. When the Boer artillery opened fire these intervals were widened, and such of the shells as were not too high burst in the spaces between the columns.

The turning force advanced by rushes on the enemy's flank, the batteries advancing simultaneously to 2,000 yards ("b" on map).

At 1,100 yards the firing line of the Devons fired volleys; the enemy replying along his whole front.

The batteries took the opportunity to change position to a range of 1,650 yards ("c" on map). They were now able to silence the Boer guns; and the supports reinforcing, the firing line advanced to 750 yards.

The rest of the action is full of thrilling interest but here its immediate connection with our subject ends.

And here we will part too.

THE DIARY OF COLONEL G. MASSY WHILST A PRISONER WITH HYDER ALI, 1780—1784.

(COLLECTED BY CAPT. C. C. R. MURPHY, THE SUFFOLK
REGIMENT.)

On the 8th September 1845 there died at Ramsgate, aged 103 years, an Irishman, Colonel G. Massy, late of the Hon'ble East India Company's Service. He was in the sanguinary battle near Conjeveram, Madras, on the 10th September 1780, against the forces of Hyder Ali, where he was severely wounded; and he, with Colonel Baillie, Captain (afterwards Sir David) Baird, and about 200 British soldiers were taken prisoners. They were exposed to cruel indignities and ill-treatment for three years and nine months until Hyder's son, Tippoo, concluded a peace with the British about 18 months after his father's death. The following is printed from the original Diary kept by the above officer while a prisoner at Seringapatam. The Diary, now in the possession of his great-grand-nephew, is about 4½ inches long, each page being about 2½ inches wide. The writing is so small that it can only be read with a magnifying glass, but every letter is well formed. Though officers and men were constantly searched in case they were hiding writing materials or manuscripts, Colonel Massy managed to conceal his Diary. The ink, which he manufactured himself, has stood the test of time wonderfully considering the Diary was begun nearly 128 years ago.

The contents of this remarkable document are here being published, with the consent of Captain A. H. McCleverty, 2nd Q. O. Rajput L. I., for the first time; and constitute a record of unique historical value.

DIARY.

1780—

8th September.—About 8 in ye evening marched under command of Col. Fletcher from General Munroe's camp near Conjeveram, and arrived at Perembancane, where we joined Col. Braithwait's detachmt. at ½ past 6 next morning without any impediment, tho' we marched in sight of ye light of several detachmts or outposts of ye enemy and surprised one small party immediately on ye road.

9th.—About 8 in the evening ye whole detachmt. under ye command of Col. B. marched for Conjeveram, on which we were immediately rocketed (Ensn. Curtis' leg broke by one); about 11 o'clock Captain Powell, Commanding ye rear guard, being press'd unlimbered and fired on ye enemy; on this ye line halted then

countermarched and form'd, but ye enemy having disappeared we moved on. Tip on our left flank opened his cannon soon after, on which we halted and returned him ye complint, ye cannonade lasted about an hour, ours having ceased, Captain Rumley was detach'd to take ye enemie's guns but could not get over a watercourse which was in their front (Ensn. G. B. Clarke's thigh was broken here); about this time (by some accident) a running fire began on ye left and ran thro' out ye whole line by which a few of our own people were unfortunately killed, but it seem'd to cause a great alarm among ye enemy, from ye confused noise they made at that time. Here we lay on our arms all ye remainder of ye night.

10th.—At daybreak we continued our march, ye horse and rockets hovering about us until about 7 o'clock when just before striking out of an avenue into the Conjeveram road we were smartly cannonaded from ye left where Tip had posted his guns on a rising ground in front of a tope, but our guns being open'd ye enemie's fire soon slackened, on which Captains Rum. and Gow, with their Grenadr. sepoys were detached to take their guns, and we were posted in a hollow or watercourse to wait their return; on ye approach of ye Grenrs., ye enemy evacuated their guns, four of which were actually taken possession of and some others (likewise evacuated) near at hand. However, they were all left and ye detachmt retreated to ye line, leaving Ensn. McConock near ye guns wounded, Ensn. Shadden was severely cut by ye horse in ye retreat. During their absence from ye line we were charged on by a large body of horse, elephants, etc. (which we since understand to 've been Hyder's advance guard), which we beat off with considerable loss, without suffering in ye least ourselves. Hyder's cannon appeared immediately after and began to play on us while more were continually bringing up till we were entirely surrounded by them and rockets doing great execution among us, but not without damage to themselves as their shot went from one party to another thro' us; our gun ammunition being nearly expended the enemy had leisure to lay their guns well, they soon blew up our tumbrels, then finding us quite silent (knowing the cause) and observing some of us in motion, they attempted another charge of Cavalry. In this they succeeded, as Col. B., finding us entirely surrounded and without a prospect of relief, thought proper to ask for quarter which they seemed inclined to grant and directed us to lay down our arms, this done by some, and they perceiving us in some disorder they took that opportunity to cut in upon us which they continued with little resistance on our part till they were tired of carnage and thought they might in safety fall to plundering. Those of us who survived the morning's business after being plundered and most of us stript quite naked we were led to Hyder's camp, where we were presented to him sitting under a tree to receive us, a horrid grin of approbation on his countenance at seeing our mangled situation: those who brought us were rewarded, for each

European with 10 rupees and each firelock 5. Here our wounds were dressed by one of our own surgeons. After ye Hero withdrew to his tent, we were conducted to one without straw to lye on or any kind of cloathing, we were served here a quantity of rice and ghee in a horse gram kettle, however, altho' mixt with dirty camphor and other filth, our mess was soon devoured and washed down with a dirty water.

11th.—About 8 or 9 o'clock in ye morning we were moved with the camp to———* towards Arcot, here we received a piece of cloth each, and 1,000 rupees were given to Col. B. to be disrtibuted among us, which was done according to rank (allowing ye soldier 1 rupee each)

14th.—We were separated in 3 different parties as follows:—Colonel B., Capts. Baird, Rumley, Lucas, Monteith and Wrag and Lieuts. Lindsay and Frazier detained in camp. Those of ye remainder who were dangerously wounded were sent to Arnee and the rest sent off immediately for Bangalore. At Arnee, we who were put in there, were allowed daily some carrion goat or ram mutton, a measure of rice each and a very small quantity of curry stuff. A surgeon to attend us whose case of instruments consisted of a spatula, a probe and a pair of sizzars, and medicine, a cudjun pot of ointment. We were here daily insulted by ye sepoys and even our own servants and cooleys, who were put in to attend us, six of us died here, leaving only 18.

October.—Mr. Gordon (with some recovered soldiers) was taken away for Seringapatam, barefooted.

November 1st—Five more of us being thought sufficiently recovered of our wounds were despatched for Seringapatam with some recovered soldiers; this morning informed of the fall of Arcot. Mounted on Tattoos our first stage was Polore, second a deserted village, westward of Trinomally about 12 or 15 miles and about 1 mile northward of a small fort on the bank of a river; third Shahgama, a poor mud fort and village, here we were confined in a large stinking square with 130 or 40 children plundered from ye Carnatic and on their way to Seringapatam, our marching provisions hitherto old rotten rice and a small quantity of curry stuff.

4th.—Thro' ye pass, a *fine road*, incredible numbers of cattle loaded with grain, &c., provisions for Hyder's army coming into ye Car. our stage, his baggage camp about 4 miles beyond ye pass; here was a plentiful bazaar, where all ye unnecessary followers of ye army were left with a small guard. 5th.—Mattore a walled village. 6th.—Coverypatnam, a stone fort near a river, in approaching it we passed under several small forts on ye tops of hills, some of which command ye road. From hence Kishnegarry is in view and some other smaller forts on hills. Here we left the Bangalore road on ye left hand. 7th.—Mainnally, a village, a fine string of horses here on this way to camp. 8th.—Chilluninglam, a village and mud

* Blank in original.

fort, here after having proposed to us to lye in the street we after some difficulty were put into ye house of a poor family as it seemed likely to rain. 9th.—A village and large tank, gunpowder here for camp. 10th.—Molwally, a village, put into a large square with ye children most of this day's journey over a rocky steep hill, an excessive bad road thro' a thick jungle. 11th.—Conconolly, a pretty stone and brick fort with a deep ditch, but little water tho' situated on a river which washes one face of it. 12th.—A village, confined in a cowhouse and abused grossly by our havildar for not letting his bullocks stand with us in it. 13th.—A village and fort belonging to Tip. Here we were put into an unroofd house, a place used by ye village people as a common necessary. No provisions of any kind allowed us here, not even firewood, Hyder's people pretending to have no authority here, the Fort is a bad one and ye village very thinly inhabited.

14th.—Arkayry, a village and old mud fort, near large tank at ye foot of a hill, it has ye appearance of having formerly been famous with ye Gentoos or Malabars, there being several small pagodas, &c., about it, but they seem now much neglected, it is a very poor village. 15th.—Seringapatam, here after ye ceremony of parading us before ye cutcherry for about an hour we were led to our prison, where we found Capts. Baird, Montieth and Wrag and Lieut. Lindsay who had arrived from Arcot ye 27th October 1780, on a gold fanam per day, which we found was likewise to be our allowance. A French Surgeon permitted to visit us every day to dress wound of Capt. Baird, no razor for shaving allowed for fear we should cut our throat and ye few knives or sizzars we had to be lodged in ye guard every night, for ye same reason. Our havildar Bruin.

23rd Decr.—M. Renoux an officer of Mr. Lally's pass'd with a letter to Hyder from ye King of France.

This afternoon arrived here 10 officers from Arnee, informed by them that Gen. Coote is arrived at Madras with a reinforcement for ye coast.

1781—15th January.—Parol from Arnee informs us that Lieut. Knox died there of a flux and dropsy and of ye fall of Zingee.

17th.—A × * frm. Ensn. Gordon says that 3 Regts. of Mogull Cavalry and 11 Battns. of sepoys are arrived at Madras from Bengal and the F. D. † that the Nyars have joined us at Tellicherry.

19th.—Offered service in form with great promises, viz, high pay, hareins, palanquins and every indulgence, &c., &c., &c.

26th.—Per F. D. Ambore surrendered by capitulation and ye officers sent to Madras. 29th.—Capt. Lucas and Ensn. McCauly arrived.

4th February.—Ye French fleet off Pondicherry. 5th.—Rain ye first. 8th.—Col. Baillie, Capt. Rum. and Lieut. Frazier arrived in irons, except Rum. he having sore legs.

* Throughout the Diary × stands for a letter.

† French Doctor.

2nd May.—Bruin relieved. 4th × frm. Pondicherry per Doc.'s boy. 10th.—Put in irons and ye F. D. detained from us. 20th.—Lieut. Coke frm. Pandinalore arrived.

18th June.—The river came down suddenly. 19th.—A salute said to be in consequence of our army being totally defeated and Gen. Coote made prisoner. 20th.—Great rejoicings, fireworks, &c. &c., &c. Sugar distributed, Gen. Coote prisoner at ye gate.

22nd July—Some of our × per Dr.'s b—y sent in wrapped on medicine, Murgaih's party currently reported to be cut off. 27th.—Books taken frm. us and lodged in the guard. 27th August.—Ye Dr.'s b—y returned with only a french × to his master. 29th.—Lieut. Butler very ill-treated by Solomon, &c.

7th September—Mr. Christie of ye Bengal detach. taken within 3 hours' march of joining Gen. Coote's army near Pulicate, on ye 3rd August the comforting intelligence we have from him gives us great hopes of a speedy release, he brings news of a Dutch war, the Cape taken, &c., &c. 9th.—Having put Mr. Christie in here thro' mistake, they now remove him among the soldiers.

14th.—By a × frm. Mr. Brunton. The men's spirits, which before ye arrival of Mr. Christie were much depressed, are now exceedingly raised by his news, which we likewise give ye Coll.'s party.

18th.—In ye evening begun a grand festival, ye parade in front of ye Raja's palace being previously prepared for exhibitions. He appeared on a chair of state surrounded by his attendance (all standing) in a balcony of his palace above ye crowd, he seems about 8 years of age. The Head Myer having observed us to look out came to our prison and ordered that any of us who stood an instant for that purpose should be flog'd.

20th.—Arcot retaken. 22nd.—Capt. Lucas although very ill is refused ye F. D. Callicut taken. Correspondence with ye Coll., &c., to escape as dangerous except by genl. opinion it appears at any future time necessary. 26th.—The Raja's festival which commenced with ye morn. concludes to-night with firing of cannon, &c., &c. During its continuance every evening the exhibitions begun about dusk when ye young Raja appeared and continued till $\frac{1}{2}$ past 6 or 7 o'clock when on ye firing of 3, 4, or 5 guns he withdrew and ye crowd dispersed. Our guard chiefly Rajputs remarkably civil, many of them deserters from Gen. Godard's army; their news all favourable, Hyder flog'd and ye Nizam preparing to join us. The present garrison here is about 1,000 Rajputs and 3,000 peons. 4th October.—Heavy rain. 6th.—To be mustered in future 3 times a day. 11th.—Monsoon weather. 14th.—Arrack stopt. That Hyder is come into his country and our army at his heels. 25th.—Hyder still in ye Carnatic. 26th.—Several of ye soldiers seen by us on ye parade this afternoon dressed as moormen drilling ye boys, it is reported they have taken service and been made Musselman by force. Several of us ill of a cold and fever. This said to be unhealthy season here. 29th.—A × frm. Sergt. Hollingsworth

that the Head Myer and a Bramin came into the soldier's prison the 19th September and chose 15 men and took them to ye Killedar's house, where they were pressed to entertain, that on their refusing they were threatened with instant death, and taken from thence one by one were forced to become Musselmen. A note frim. Mr. Brunton corroborates the above.

3rd Nov.—x frim. Mr. Bn. says that others have been also forced to become Musselmen. That ye Coimbatore country is ravaged and Carrore taken. Hyder's baggage come to Bangalore. Thyrium Saib taken with about 5,000 men, several elephants, guns, &c., &c. 4th.—Per F. Doc. in ye bazaar that our army is at Singarpett near Shangama. That Col. Lang with an army has entered ye country by ye Sadgur pass. That Hyder's Army is much distressed for provisions.

6th.—Per bazaar. That a Battn. of Bengal sepoy's detached for provisions was cut to pieces between Nellore, Serophy, and Tripaty, on which our army retreated to Chingleput for want of provisions. A servant women of a Wahab's in ye bazaar sends her master's compts. per servants.

7th.—Yesterday's news contradicted and ye following given, that there had lately been a general engagement in which Hyder was totally defeated and lost great part of his bazaar, &c., &c.

10th.—Capt. Baird's irons put on. Per Dr. that Hyder's brother-in-law, women and baggage are to be here in 4 days.

14th.—x in Persian from A.W.G. with compts. sent to Rumley to whom it was addressed.

15th.—Per Bazaar. That peace is treating of. Per sepoy's that Kayrins Saib is certainly taken.

16th.—And frim. Dr. to ye Coll.—Sr, Yr. servt. casting a sign to one of us some time ago gives us some reason to think that you would be desirous to know something of our present unheard of unfortunate situation, not to be paralleled perhaps in ye history or account of any nation. On Wednesday ye 19th September the Bramin came into our prison and after falling ye men in he selected ye underwritten from ye rest, smiths being prepared to knock off their irons, without even giving us ye smallest idea of what was to ensue, conducted us to ye Nabob's where they informed as upon what account we were released, and in a very flattering manner requested of us to take service; however all their promises and tenders were refused with disdain by 14 of us; then they changed their accent and menaced us in ye severest manner, and ye Gimmel Myer threatened to take our lives, we were conducted from thence to a large square ye repository or seminary of these boys you see every night at exercise. Upon our arrival there how great was our surprise to find two English lads amongst those boys who had been forced to become Musselmen three months before our arrival, one of whom is a Mr. Clarke who had been an Ensn. in the 2nd Battn. 2nd Regt. and a private of the same. They immediately informed us that we should be forced to become Musselmen, which was only

too true. We remained there for a month upon 6 cash a day, mutton, rice and ghee, &c. On ye 30th October we were conducted to the cutcherry and there examined if we would take these boys and teach them their discipline, for which we should receive one fanam per day with provisions, cloths, &c., which we hope in our present situation you will not construe into any disaffection to our country or officers, it being all force and constraint, however actuated by a lively and at the same time pungent sorrow that you in your present distressed situation, should be a melancholy witness of ye same, that men so lately under your command, whose indulgence and paternal care, particularly on the day of action, was second to that of none, and we humbly make bold to assure you that scarce filial duty can be exceeded on our part, every man in ye other prison and here, being at any time ready to lay down our lives to rescue you from the smallest harm. Our fondness, &c., was the cause of running this hazard, and most heartily and sanguinely wishing to see you shortly released and in a situation of releasing us unfortunate victims from ye chains of this barbarian.

(Signed)

Jno. Cowen.	} Light Infantry Co., 73rd Regt.	Wm. Roberts. { Capt. Jones'
Jno. McKennan.		Wm. Inwood. { Compy. Artillery.
Jas. Sinclair.		Jas. Lister, Reggaults Do.
Arth. Ross.		Ehass Morris Giless Do.
Jno. Mullock.		Benters Woodley } Ragg's Co.
Robt. McKenzie Drmr.		Henry Pearse }
Corpl. Robt. Anderson,		Wm. Simmon, Greder 2nd Batt.
Grenadr. Co. Do.		1st Regt.
		Ralph Smith, 2nd Batt. 2nd Regt.

On ye 30th October last Duncan McIntosh Drmr., Capt. Baird's Co. and Donald Stewart, Fifes 73rd Grenrs. were brought here and also forced to become Musselmén.

Sir,—Encouraged by ye general applause you hear among our unfortunate countrymen, I take ye liberty of addressing myself to your well known mildness in forgiving my appearance upon this parade. I am touched with every distress that can attack a man reduced to this disagreeable alternative, I have been a Sergt. in the Bengal Arty., and must needs say, that through ye proceedings of an iniquitous court martial, which you one day, Sir, may more at large know was obliged to shelter myself in this Tyrant's hands, I hope Sir you won't construe this into the least disrespect, no one having a more delicate sense of his duty and respect to such a gentleman as Coll. B. is; therefore hope that I may be hereafter considered with some degree of compassion. I've ye honor, Sir, &c., I.M.D., once Ensign in His Majesty's 19th Regt. Infantry and late a Sergt. B. Artillery. P.S.—News—Hyder's ruin inevitable. Lt. McCartiny with 5 Regt. arrived 12,000 sepoys from Bengal and 1½ Co. Arty. with 15,000 bullock load of rice and bullocks for ye army. The men in prison are in general very healthy, they lost 30 mostly by a swelling

that takes them in ye legs. Sergt.-Major Atkinson is of ye number. Mr. Gordon on 9 cash per day and double allowance of mutton, etc. Mr. Brunton only one pice and a seer of rice per day; ye men by great industry keep themselves in banyans and trowsers and shift ^o very 10 days at least.

19th.—Per Gd. Our army in 2 divisions at Wandiwash and Arnee. Hyder 12 or 15 coss fm. Arcot which is in our hand a long time past. That we are at peace with ye Marattas who are about to enter this country. 20th.—That we have taken 6 Battns. sepoy in Arcot. 21st.—Per F. D. Hyder at this side ye pass in great distress, offers peace and 9 lakh pagodas. 22nd.—An escort with provision of ours attacked, without success. Hyder sues for peace. Gen. Monroe killed.

23rd.—Per Gd. That there has lately been an extraordinary great battle since which Hyder has been so much in awe that he avoids us upon all occasions. Per bazaar. That Gen. Monroe and Col. Brown are killed. 24th.—That Hyder is wounded. That we lately during a heavy rain stormed his camp, made great slaughter and took 900 barrels of powder, that he is surrounded by our armies in great distress, his horses and bullocks daily dying for want of forage and that all our troops are joined from Poona with 12,000 Mahrattee horse and Raggoboy fixed on ye musnud there.

25th.—Orders for everything coming into ye prison to be strictly examined. 26th.—No more white paper to be admitted into prison. 27th.—That Arcot is still in Hyder's possession and that he is blocked up there in ye utmost distress.

30th Decr.—This afternoon in front of our prison hollow'd out that our army was in a flourishing condition at Conjiveram. H. at Arcot still in his possession, ye waters having prevented our taking it yet. That *Burnarais* had come over to us; Gen. Monroe and Col. Brown killed. Hyr. in a bad way.

1st Decr.—Gentn.,—I was to-day to my great surprise accosted by one of your boys who informed me by name, that ye officers in general were surprised at having no line from me in particular. In excuse for this seeming neglect I can only say that the privates in general were unwilling to deliver any letter from me without seeing the contents, being apprehensive I should complain of the manner they had behaved to me since their arrival here, which has indeed been such as showed they were very happy to have it in their power to insult any one who had been formerly of a rank superior to themselves with impunity. However, it is wrong to mention anything by this kind as I am at present in a situation so very disagreeable in many respects that any one thing is hardly worth mentioning, even, were it likely to be remedied, by even a hint of its being disagreeable. I arrived in Madras in June 1781 in a condition vastly superior to ye other cadets in general; however having been 2 years in the Militia Ensn. and Lieut. in England and of course being used to a very expensive way of living together with a carelessness for money and lending to too many

who had no prospects of being able to pay me, I soon got into debt (notwithstanding I was largely supplied by Gen. Monroe to whom I was particularly recommended and at whose house I lived at Madras, a Mr. Mobray who was very much my friend and 2 or 3 others at Madras) to such a degree as obliged me to think of getting to camp or somewhere out of ye reach of the Mayor's Court, towards which I applied to ye Governor who told me as soon as any ship sailed for Cuddalore I might go. However it being dangerous waiting so long, set off for camp on horseback leaving directions with my boy to see everything sent off after me as soon as possible. I arrived safe at Pondicherry, where when at dinner at a French tavern I was made prisoner and that evening sent to Meersaib's camp (since killed) where I arrived next morning. I was at Pondicherry offered service and 300 rupees per month and at Meersaib's camp again and afterwards at the Nabob's grand camp which I again and again refused. I staid a short time there and was afterwards under a guard of 2 Havs. and 6 sepoy's sent to ye Nabob's camp then laying siege to Tanjore which was commanded by Col. Brathwait, 2 days after my arrival I was taken before ye Nabob who asked me ye usual questions, in answer to all which I professed ignorance, alleging that my short stay at Madras and my rank (I having been appointed Ensign in ye 2nd Battn. 2nd Regt. commanded by Major Hopkins) prevented my having any insight into the management of affairs at Madras. The next day he marched to Trichinopoly where I understood he was to lay some time. In a few days after, Good God! what was my surprise to be sent for by ye Commdt. of ye Battn. with which I was confined, and there informed it was ye Nabob's desire I should consent to embrace Mahometanizm. I refused, notwithstanding ye most dreadful menaces and most alluring promises to consent to a thing so much my abhorrence; ye next day I received my usual allowance of rice, but on asking for ye 3 pice, my daily pittance, was informed it was stopt, till I agreed to ye yesterday's proposal of becoming a proselyte; I was a little shocked but resolved to persevere untill some relief or other came; four days after I received no rice at all nor ye next day after I received no rice at all nor ye two next days after which being worn out not having eaten anything except a little rice ye sepoy's afforded me, I with my tongue consented to a thing my heart abhorred, on which I received my former allowance and what had been stopt ye 7 foregoing days. I shortly marched to Seringapatam in ye most horrid despondence of mind. On my arrival I was questioned with regard to my knowledge of ye exercise, which I said I know nothing of. However on ye arrival of a Chaubuck, I soon went thro' ye Manual and platoon exercise to ye satisfaction of ye Myers 2 of whom were present. I then was questioned with regard to my having consented to embrace their damn'd religion which I denied, however was, soon on the 2nd mention of ye Chaubuck and ye former usage, induced to repeat

my consent, tho' on ye arrival of the boys you daily see and being asked if I would teach them ye exercise, I refused, saying I had refused to take service and (till starved to it) to become a Musselman I would rather do both or even die than teach others to fight against my country, which in my idea was much than either; I was then removed to ye prison where I still am and found an European of ye name of Smith of ye 2nd Battn. 2nd Regt. in as miserable a condition as vermin, dirty clothes, bed, &c., could reduce a man to. After this I was forced to become a Musselman. About 3 months after my arrival I was very much surprised one morning to see a set of young men very cleanly dressed, each of whom had also been forced to become a Musselman. I had forget to mention that at first ye allowance of ghee, meat, &c., was very great, however we had only 3 cash per day. On their arrival we received 6 cash and some time after a fanam. I have done all in my power to make them refuse going to exercise or complying in any respect with ye Bramin's orders; however, it is in vain. Smith before I came went daily to exercise, however I tho' I was tied up to be flog'd twice would not go on any account. Ye usage of ye Privates towards me has been generally most rascally which together with other things makes it my daily wish to die and has almost tempted me more than once to lay violent hands on myself. I hope soon, however, and have reason to expect in a short time that ye arrival of our army will at once put an end to our confinement and Mahometanism. My having confessed many things against myself which otherwise never could have appeared is a sufficient proof that I scorn to palliate any part of my offence and misconduct by a lie. I am, my Dr. brother officers, if my folly has not forfeited my right to call you by so dear a name, Yr. most obt. &c., Heny. Geo. Jennings Clarke, November 27th, 1781, Ensign, 2nd Battn. 2nd Regt. There is among ye rest a young man Sergt. in ye Bengal Artillery, he says he was an officer in ye King's service and I see no reason to doubt it from his education, &c., his being of an athletic constitution secures him from those evils I so much complain of. He says on account of some ill usage he received, no uncommon thing in the Company's service, he left camp, and not daring after having acted so derogatory from ye character of a soldier, ever to see ye English Commander, lately took service and not knowing he was to be made a Musselman arrived with ye party here.

x addressed to Captn. Lucas, 1st December 1781.

Sir,—Often very often have I proposed addressing myself to you since my first appearance upon this parade, but my present unfortunate situation forbids me to do myself that honor, nor indeed could anything impel me to do it but only motives of conveying to you all ye news I have learnt. I once had ye honor of bearing a

Commission in His Majesty's service; thro' unforeseen accidents was obliged to resign, having thereby highly displeased my friends was constrained to come to this country, no higher rank than that of a Sergeant and served one year in ye Bengal Arty. was drafted for this expedition, and came over in ye Kingston Indiaman, was soon after suspended by ye sentence of, I must say, an iniquitous Court Martial which impelled me to commit a crime that I fear will ever sully my name and which I assure you hourly represents itself to my mind with all its ill effects nor can I at all harbour an idea that a gentleman of delicacy and politeness will once suspect the veracity of what I now avow. I remained prisoner in this garrison near 10 months among the Europeans, where ye repeated insults and injuries I received from Mr. Gordon and ye little delicacy that he observed actuated me several times to say what I ought not to say, upon ye whole he has treated me agreeable to his low education and ye abject occupation he originally followed; I humbly request your pardon for larding this letter with injuries on any particular, but I have reason to believe he has not omitted drawing my portrait and that in ye most unfavourable colours; to be candid when ye Bramin came to select men to remove them from ye prison, I voluntarily offered myself and was accepted. On ye 19th September we were conducted to ye cutcherry and there were made large promises, but they didn't let ye smallest hint of their design of making us Musselmen transpire, we were conveyed from thence to ye seminary or rather prison of all those boys you see every day at exercise, in ye evening we had a smart dispute with ye gd. who were getting us shaved, however, we poor wretches were obliged to suffer ourselves to be treated at their discretion and were forced to become Musselmen; we remained near a month upon ye same allowance we had in ye European prison, we were then brought before ye Circar where they lavished many promises on us if we taught ye boys English discipline for which we should receive one fanam per day with allowance of meat, ghee, rice and Musselman's weeds; so much for this adventure. N. B.—I make ye above defence against Gordon, not thro' any motive of fear of his being in a condition to harm me, but I suspect it may hereafter be a subject of his, he has from time to time given ye greatest apprehensions to all ye unfortunate prisoners where he is by saying that they should receive no pay after their return, he likewise by concerning himself in their little quarrels has threaten'd some with severe punishments and openly said that he would not forget ye names of others, he has not hesitated to arraign ye probity of his commander publicly. Ye veracity of ye above will be corroborated by almost every prisoner belonging to Coll. Bailie's detach., and I hope will be sufficient to excuse my seemingly severe accusation, as no gentn. seen in our unhappy situation should harbour ye smallest idea of rancor to each other. News—Vellore not yet relieved tho' vigorously attack'd. In a sally about 5 months ago, ye enemy were routed and 4—24 pounds. taken, a second sally made some time after, but obliged

to retreat with ye loss of about 100 sepoys killed and taken and a drumr. who is now here with ye Chaylas. That a few weeks after ye junction of Coll. Pierce there was an engagement near Conjeveram almost genl. The enemy routed with infinite loss retreated to Arcot, Gen. Monroe and Coll. Brown killed. Lt.-Coll. Owen detached for provisions was attacked and lost 1 Capt. and 100 sepoys. But Gen. Coote rescued him and brought in ye provisions, &c., to ye army, that ye enemy now in and about Arcot are in ye utmost distress for almost everything. Our army 55,000 and in want of nothing in ye highest spirits, that ye great waters only retards ye taking of Arcot. That Vellore is breached, but ye enemy were beat back from it twice and so pepper'd that they hardly will attempt storming it again, in short every one in this Town seem to think that ye Bahauder's sun is set. We have acquainted Coll. B. with everything that we know and in future shall omit no opportunity of transmitting ye same to you. I am, &c., I. M. D. *N.B.*—Pardon ye uncouth manner in which I have painted ye forgoing lines, I have been interrupted a thousand times by a rascally Falkie? who asked me several times if I was writing to Baillie.

× to Captn. Baird.

Sir,—Our frequently meeting with some servant or other belonging to our officers encouraged us to send a few lines to you with some account of our situation which is literally as follows, *viz.*, on ye 19th September last ye Bramin came to ye European's prison and after falling ye men in selected from among them 15. From thence without further ceremony we were conducted to ye Nabob's and there ye question put to us if we would take service which was answered in ye negative by ye whole upon which they severely menaced us and sent us under a strong guard to ye seminary or rather prison where those boys you see every night at exercise are kept and to our very great surprise we met there with two English lads, one a Mr. Clarke an offr. in ye 2nd Battn. 2nd Regt., ye other a private of the same named Smith, who once had been a servant to Mr. Rumbold, who to our great mortification informed us that each of them had been forced to become a Musselman and that we should also be forced, which was done. We were kept for a month on ye same allowance we had in ye former prison. 30th October.—We were brought to ye cutcherry and there commanded on pain of death to teach those boys their exercise, for which we are allowed 1 fanam and provisions per day with cloaths, &c., so we expect Sir that you and ye rest of ye gentn. confined in this garrison will not construe our appearance to be ye effects of choice or any disaffection but downright constraint as all ye prisoners can testify. All ye news that we can learn seems to agree. that ye

Tyrant will soon be humbled, we expect to be out in less than 3 months. (Signed.)

Rob. Anderson,	Corpl. Grendr.	73rd Regt.
Dond. Stewart,	Fifer	Do. Do.
Duncan McIntosh,	Lt. Inf.	
Jno. Comen,	Private	Do.
Arthur Ross	Do.	Do.
Jas. Sinclair	Do.	Do.
Jno. Mallock	Do.	Do.
Rob. McKenzie,	Drumr.	Do.

N.B.—34 of ye Compy. and about ye same No. of ye Grendr. are here and at Bangalore.

× from Duncan McIntosh, Drumr., to Captn. B—d of ye state of his Compy. 70 and of ye Grendrs. 73rd Regt. likewise of his own and ye rest of ye men's miserable situation and cruel treatment; that only one man of ye 2nd Compy. (a Grenr. Edward Dangerfield) offered to take service who is since dead. That a man of Captn. Mackenzie's Compy. taken ye 18th July 1781 near Cuddalore, says that Captn. Gilchrist died at Chingleput in Genl. Monroe's retreat.

7th.—By a Collery, whose brother was in camp when in ye last engagement near Conjeveram Tip and Keyrim were taken prisoners and Hyder routed. That ye Nizam and Bazel Jung have taken ye Cuddepa country and are burning and destroying ye adjacent parts belonging to Hyder. At night a report that a large party of Morrotto horse plundering and destroying ye country about here within a few coss. That a sepoy is just come into ye fort cropt of his ears by them.

8th.—Ye report of Morrottoes very general. Ye 2 Myers despatched with a party of horse to bring an account of them. 9th.—No bustle about ye Morrotto, ye Myers returned yet ye report still prevails. 11th.—M. F. Dr. Nollous frm. ye Verando that there is a Morrotto camp within 5 days' march of this. 12th December 1781.—13th ×. Gentn,—Your very kind and friendly note I received, words cannot express my feelings on ye perusal of your proffer in using your interest in my behalf at a proper time, for which I return you all my most sanguine and unfeigned thanks, I will not undertake to describe to you my confusion, it is only such as every gentleman should feel in a similar situation. My hearty wishes are as indeed of all my companions, who to do them ye justice that every man should a fellow subject, cannot be exceeded in loyalty to their King and sympathy for ye suffering of these officers by any that your thraldom may soon terminate and ye Tyrant be humbled with ye dust. News—That the Morrotto alarm was false, it being only a party of robbers who plundered some villages. Both armies near Arcot.—I. M. D.

14th.—By a sepoy formerly of Kelly's Bn.—That Chittore is taken by us. No account of ye Nizam or Morrottoes. 16th.—Muirhead's

man Hoosin hausin feast begins. 18th.—Some sepoy (with their families) arrived in irons taken near Trikhore of Bilcliffs' Bn.

25th.—That there are 6 ships of war with European cavalry and other troops arrived at Madras.

27th.—250 fans. from Coll. B.

1782—2nd January.—× from one of the men lately made a Musselman accusing Mr. Ck. of being the cause of their having been made Musselmen and painting D.'s character in ye most unfavourable light, says that he declares he will have Mr. Gordon (and others) made a Musselman, he says much in favour of Mr. Gordon's behaviour among ye men and advises to drop correspondence with Dempster as dangerous, sends Capt. Bd. 6 fans.

4th January 1782.—Arrival of 2 Europeans and a number of children from ye Carnatic.

5th January.—Thro' ye servants per Dmr. that 13 French ships are arrived at Pondicherry and our army marched to Madras. 20 men more from ye prison have voluntarily taken service this morning but ye soldiers' boys say that they were taken out and forced to entertain.

8th.—Terribly alarmed this morning by threats of forcing us all to become Musselmen.

14th.—From Coll. B. Chittore taken by us, General Stewart lost his leg, Coll. Brown, Capt. Walker and Lt. F. Baillee killed.

16th × × × from B—n. Negapatam taken in September last, our army in Cocalore plain amounting to 28,000 men. One of ye above mentioned 2 prisoners is Jefferies a Sergeant of ye 15 Bn. who deserted in November, ye other a Sergt. of artillery. That Calicut was taken ye 13th inst. Peace much talked of.

19th.—× from Bn. That Mr. Clarke writes him that he was sick at Madras and riding out one morning for his health as far as St. Thome he was made prisoner and carried to Hyder when he was forced to become Musselman, &c. That Gdn. and he are threatened with Mahometanism. × that Hyder took great umbrage at our sending his people to Bencoolin ye September last. Peace making letter from Gn. That the Bramin who has hitherto selected ye prisoners for Musselmen threatens our quarter and makes him and Bn. drag on a miserable existence under ye dreadful apprehensions of being compelled to wear gowns and turbans.

24th.—Reported that ye soldiers are to be sent hence, we likewise expect a disagreeable removal, reports being to that purpose. Jennings' thigh cut by Capt. Monteith.

25th That we have an army joined by some Morrottoes on this coast preparing to attack Naggrum. That Sirdar Cawn's party is cut off and Calicut taken, several of ye black Chaylas put in irons.

26th.—Ye soldiers sent off for Chittledroog, 50 being left here.

6th February.—Visited by Sittaboy who arrived yesterday from camp. 7th.—Troops, chiefly Colliers, of late frequently marched about ye parade, &c. Vakeels gone to Madras to treat of peace. 13th.—Account of Arcot being taken arrived here 3 days ago. A French fleet on our coast.

16th.—Peace ye general report, ye palace, streets, &c., preparing for ye reception of Hyder who is expected very shortly. 29th.—Report that we are to be moved hence.

23rd.—Coll. B.'s boy having bought some instrument from ye bazaar, without ye Goola's knowledge, is confined in irons and a strict search is making in that prison. We therefore expect a visit here. One of ye Europeans who was made a Musselman (McKennon) is exposed naked in ye sun all this day in ye parade in stocks.

25th.—McKennon continued exposed as above till last night or early this morning. 27th.—That Genl. Coote is taken prisoner. 28th.—That 15 Battns. of ours are taken, 7,000 French joined Hyder now going to lay siege to Madras.

3rd March.—That Hyder has destroyed and evacuated Arcot. Our army at Madras. 5th.—Hyder on this and our army on ye other side ye pass. Peace treating of.

14th.—A Battn. of boys detached with several of ye Europeans called Musselmen towards Calicut, well armed and accoutred. Coll. B., R. and F. taken out of irons. 22nd.—Heavy rain and threatening weather for some days past in consequence of which our prison roof repaired, much good news, a report of peace. That Tip has been detached to ye Circars which he plundered to Musselipatam.

That Hyder is at Arcot and we can do nothing against him. That we have gained a good victory over him lately. Peace talked of, we refuse the terms offered expecting ye Nizam to join us, ye Circars plundered by Tip to Rajamundry.

24th.—Hyder joined by 12,000 French on which our ambassadors were dismissed.

27th.—Coll. Brathwait's detachment, (17 officers, a Sergt. and a B. Commdt.) arrived; ye Coll. and Mr. Holmes detained with Hyder in camp. They were attacked by Tip ye 17th February in ye morning in their camp on ye bank of ye Colleroon about four miles from Pandelore and surrendered about noon next day, having attempted a retreat towards Negapatam in ye night.

14th April.—Wandiwash taken, our army at Madras chiefly consisting of Europeans, the sepoys having deserted to Hyder for want of pay. Lt. Lind died this night of a flux, together with fatigue and ill-treatment he received on his march hither.

15th.—Lind interred. That 2 battles were lately fought in ye Carnatic in which Hyder was defeated.

18th.—That ye party acting against us at Calicut were lately defeated and their Commander (Muctune Saib) killed, that most part of ye Chayla Bn. deserted to us. That Hyder marched towards Madras and was attacked by our army near ye Mount where he was defeated with ye loss of 6,000 cavalry and several thousand infantry. That ye French fleet in an engagement with ours lost 12 ships.

May.—Cuddalore taken. 9th.—Ye head Myer desirous to know if there are any carpenters or smiths among us.

16th.—The servants going to ye bazaar put a stop to and 2 Collieres appointed for that purpose. An excessive hard storm of

thunder, lightning and rain this evening. Peace with the Morrottoes who with Gen. Goddard are expected in this country.

20th.—3 Battn. of sepoy, one of pikemen, ye other two of firelock and matchlockmen came into ye fort, said to be ye remains of Sirdar Cawn's army.

2nd June.—A great battle lately Hyder defeated, the French joined us. 3rd.—Hyder defeated, Lally taken prisoner. 10th.—At peace with the French who have joined us against Hyder. 11th.—A large detachment preparing here for ye Calicut country. 25th.—Tip lately attacked and near being cut off but rescued by his father which brought on a general engagement in which we lost; 150 Europeans taken. That 12 European children, viz., 8 boys and 4 girls with some other Car. people are arrived prisoners, that about 15 days ago we attacked ye enemies camp in ye night, several guns taken and ye whole routed with ye loss of 12,000 of *his* choice horse and almost a battn. of *officers only*. The French neuter. That next morning Arnee was stormed and taken, ye gates being blown open. That after this affair Hyder made proposals of peace which was rejected with disdain.

1st July.—A feast with us in honor of the glorious battle of Porta Nova. Various reports.

5th July.—Captain Lucas died of a flux. 7th.—Mr. Hope died of ye same disorder and an inflammation in his lungs. 9th.—Ensign McConochie died of a B. flux and strangury. 17th.—Peace, ye general talk of ye place for some days past. Three Europeans and 80 boys arrived prisoners from ye Car. yesterday. 18th.—Various reports. Hyder's army at Dohy Gur, ours at Madras. 22nd.—Arnee not taken. The enemy at Dohy Gur, our army lately beat is cantoned about Madras very much reduced, not able to act. No talk of peace. 26th.—Sampson's irons put on, although his wound is open, said to be a positive order from Hyder.

13th August.—Ransom scheme, rejected by ye Killadar. 15th.—A fort on this coast by description supposed to be Mangalore besieging by us this month past. A number of children, etc., inhabitants of ye Carn. arrived prisoners; this and most part of the last month in general wet weather. 16th.—Ye *enquiry* 3 days. 20th.—Hyder in possession of Trichinopoly but beat off again with great loss. 23rd.—Villore relieved 3 days ago; 3 of our ships with troops arrived at Mangalore. 30th.—Still rainy weather.

RAFTING EXPERIMENTS.

BY CAPTAIN G. R. P. WHEATLEY, 27TH LIGHT CAVALRY.

The question of river crossing by troops and especially by cavalry has always attracted considerable attention, and has been the subject of frequent experiment.

In 1882 Skobelev's orders were—

(1) If the river is small, place men's kits and saddlery in boats or rafts, men and horses swim.

(2) If the river is large and swift, place the men in boats with kit and saddlery; tow the horses behind.

(3) If there are no boats or rafts, swimmers with their rifles, ammunition and entrenching tools round their necks, swim across with a rope, by means of which the others pull themselves across. The horses saddled and with bridles hooked over the cantles are then driven over *en masse*.

If there are boats carry out the orders in (2) above, but if there are no boats, the word "rafts" opens out a large field of thought in view of the necessity for obtaining efficiency without either expenditure of time in collecting materials, or undue encumbrances in the shape of ready made bridging materials to accompany the force. Given time we may expect a pontoon train to arrive; but as regards cavalry at least, the pontoon section cannot keep up, and the loss of time involved in waiting for it will result in the loss of their distance ahead of the slow moving infantry, to the enemy's consequent advantage. Of all the improvised rafts I can think of which have been used to fill up the gap, there are none that can be called good, or be said to even approximately meet the case.

Let us consider some of the commonest kinds. They depend for their buoyancy on—

(a) Chatties.

(b) Empty oil tins.

(c) Bundles of hollow reeds.

(d) Empty barrels.

(e) Grass wrapped in large tarpaulins.

(f) Inflated goat skin bags.

(g) Inflated rubber bags with covers (Poliansky's).

(a), (b), (c) and (f) vary only in their degree of unreliability, besides being like (d), difficult to find when wanted. (e) The tarpaulins are expensive, and must be large and consequently heavy to be efficient. They require extra transport. They would

not be required for any other purpose, and therefore if wanted in an emergency would probably not be so placed in the Transport Trains as to be obtainable. (g) Very efficient but expensive and would require extra transport, the inner rubber bags being also very liable to deteriorate in tropical climates. They belong more to the Bridging Train and seem to come under the category of Strategic Bridging Apparatus rather than to what may be termed Tactical Bridging Apparatus always in possession of units.

A chance conversation with an officer in a railway train put me in possession of a fact which seemed to supply the required link. I remembered afterwards that I had seen the same fact mentioned in a circular from A. G. of India, dated 1892, but apparently the idea has never been gone into.

The circular in question states that—

“A waterproof bag hermetically sealed, not only does not sink if filled with saddlery and kit, but will bear a certain amount of weight,” rafts or rafting materials not being procurable. One can picture the feelings of a man called upon to swim a river, “large and swift,” with arms, ammunition and entrenching tools round his neck; and even if the river were “small,” there might be some competition to be numbered with those who were to pull themselves over by the rope; nevertheless the feeling of the genuine non-swimmers performing this same latter feat can be better imagined than described. Anyhow the crossing under these circumstances would probably take some considerable time. But if each man were in possession of a waterproof bag as described above, every man’s kit would go over dry, and a few bags joined together would solve a great many of the difficulties of the non, or indifferent swimmers.

The circular in question also says that the “method consists of a canvas bag soaked in some waterproof mixture.” My efforts to produce a waterproof mixture not having been a success, in attempting to come by a bag such as is described, I had to fall back on the known waterproof materials. The bag required must be of a suitable size and in addition be strong, light, cheap and efficiently waterproof.

It must be not only waterproof but remain so under considerable pressure when in use, and must not deteriorate from disuse, nor wear out quickly with fair wear and tear. The known materials are—

- (1) Rubber composition sheeting.
- (2) Tarpaulins.
- (3) Rainproof fabrics for wearing apparel.
- (4) Willesden canvas.
- (5) Millerrained khaki.
- (6) Pawlins.

I rejected (1) mentally without trial as expensive, and being rubber unsuitable in the tropics; (2) rejected without trial on account of its weight and expense; (3) serges, etc., rejected as not

stout enough; (4) rejected for weight and cost when really waterproof. I experimented with bags made of—

- (a) Millerrained khaki,
- (b) Messrs. Birkmyre's N. khaki.
- (c) " " N. prepared.
- (d) " " Double post office bag.
- (e) Two regimental pawlin ground sheets sewn together to form a bag.

Saddlery and men's kits were placed inside each bag, and the mouth tightly tied with twine. They were all placed in water and left to float.

After 20 minutes (e) had leaked all over and the contents were wet, although as a ground sheet this material is efficient.

After four hours the remainder *a, b, c, d*, were opened, and the contents were dry; (a) appeared to be soaked through, but the contents were not wet however.

Before the I. G. Cavalry in India one of each of the bags (*a, b, c, d*) was filled with saddlery and kit and used as a float, on which a sowar was towed across a stream. In this case the sowar naturally clung somewhat tightly to the bag in his endeavours to keep his balance and remain on the top side, which to my surprise he succeeded in doing in each case. Had the stream been broader I do not think he would have been successful; and to a non-swimmer the bag used in this way would have afforded the same amount of satisfaction as would Skobelev's rope.

The result of the unavoidable rough handling the bags received was that the kit in all of them was damp in various degrees. Whether the water had been forced through the material, or whether it had got in at the mouth in each case, I am not prepared to say. Judging by subsequent experiments with the same bags, and by the fact that the mouth of each was in this case well under water, I think it was by the latter that the water got in. The buoyancy of the bags was not impaired in any way however.

The comparative weights, etc., of these bags were—

	Weight.	Size.	Cost. Rs.	
(a)	3lbs.	6' x 22"	2-8-0	Contents considerably wet.
(b)	3lbs.	5' x 2' 10"	5-0-0	Contents damp (slightly so).
(c)	3lbs.	5' x 2' 10"	4-8-0	Ditto.
(d)	6lbs.	4' x 2' 10"	8-8-0	Contents practically dry.

(a) retired from the contest as not up to standard.

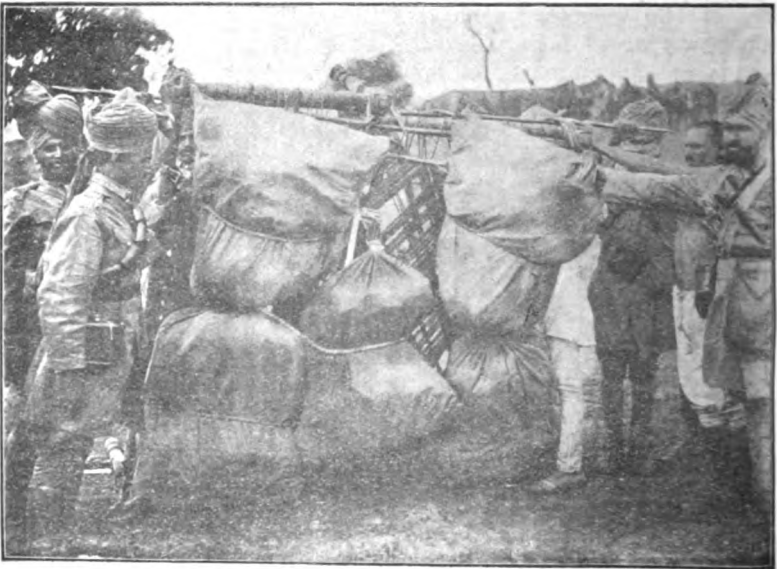
(d) retired, having completely demonstrated the truth of the proposition and its practical possibilities, but at the same time being put out of court on account of weight and cost.

The question which now presented itself naturally was—if one N. khaki bag filled with saddlery and kit will support a sowar, what will 5 such bags support as a raft?

The answer is given in the following experiments. The contents of each bag are shown in photo. No. 1 ; also a bag (filled) in the



same photo ; photo. No. 2 shows the formation of the raft.



In an experiment not photographed, 5 saddle filled bags carried 4 sowars in drill order, or 16 sets of saddlery; estimated weight about 600 lbs. men, or 800 lbs. saddlery. The same bags filled with grass carried 8 men with a large freeboard.

In photo. No. 3 the 5 bags (saddle filled) are carrying 15 sets of



saddlery or 750 lbs. The weight of a set of saddlery averaged 50 lbs.; the weight of a bag filled with saddlery and men's kit averaged 80 lbs.

The smaller capacity in this instance is owing to the loss in bulk of some bags due to bad filling and tight lashing—see photo No. 2.

In photo. No. 4 the bags are grass filled and are carrying 8 men but



with not much to spare. The bags were not so full of grass as on the previous occasion when 8 men were carried with a large freeboard.

It is evident that the load which can be carried varies according to the way the bags are packed and lashed, and that although grass filled bags will carry double the number of men that saddle filled bags will carry, yet they will not carry double the number of sets of saddlery. The reason probably is that 8 men can distribute their weight over the whole area of the raft, whereas 30 sets of saddlery will not go easily on to the raft, and the weight gets into a pyramid on the centre. Therefore before calculating a full load on grass filled bags it would be as well to adopt the lower figures of men or saddlery; or to experiment with a longer and broader raft in order to ascertain its maximum capacity.

A Native Cavalry squadron consists of 120 saddles. To allow of a margin of safety I calculate 6 bags per raft, or 20 rafts formed by the saddles packed in 120 bags. The remaining 3 squadrons of the regiment can utilise these rafts to ferry their saddlery and arms and kit over in turn. The amount to be ferried over them for each squadron is—

Saddlery	...	...	120 × 50 lbs.	...	6,000
Men's kits and ammunition			120 × 30 lbs.	...	3,600
Rifles, sword and lances	...		120 × 20 (rather less)		2,400
Total				...	12,000 lbs.

Referring to photo. No. 3 the load there are 750 lbs. on 5 bags, hence a load of 600 lbs. on 6 bags is on the safe side. Each raft then can take—

6 sets of saddlery	...	...	300 lbs.
6 sets of kit and ammunition	...	...	180 „
6 sets of arms ...	...	...	120 „
Total			600 lbs.

Each of 3 squadrons can get over in one journey, loading their complete kit on one side, swimming their horses and unloading the kit on the other. Similarly one troop out of 4 can carry over the kit of 3 troops in one journey on 5 rafts, each raft having a minimum carrying capacity of 600 lbs.

Transport and weight. The question of carriage for these bags now comes up.

I propose to substitute one bag (weight 3 lbs.) for each rubber waterproof sheet (weight $3\frac{1}{2}$ lbs.), carried by Regulation in First Line Transport for each fighting man.

The bag is more useful as a ground sheet than the waterproof sheet is, from the fact that the bag would be useful to sleep in during wet weather.

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The Burmese War, 1824—1826.

II.

[Continued from the July Journal.]

The Royal and Indian Navies saw a good deal of service during the First Burmese War, but as full accounts exist it is only necessary to refer to the principal occasions on which they co-operated.

At the commencement of the war the ships gave valuable aid at the capture of Rangoon. During the operations near Kemmendine the Burmese employed fire rafts against the flotilla, but these were successfully dealt with by the crews.

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The following account of some fighting which took place at Cheduba in February 1825 is typical of Burmese tactics. The first misfortune was due to placing confidence in native guides who wilfully led the column astray. At first the troops met with a fair measure of success; but after several hours' hard jungle fighting they found themselves unable to advance any further and, fatigued and without water, were five miles from their boats, with the enemy on every side and with communications absolutely cut. There was nothing for it but to fight their way back to the boats, the Burmans occupying every position as soon as it was vacated and keeping up an incessant fire upon the troops, while, to add to the difficulties of the situation, the creeks which had to be crossed had filled with the incoming tide, and it was not until after three hours' hard fighting and marching that the force was enabled to re-embark.

At the conclusion of the war the Royal and Indian Navies were included in the vote of thanks passed by the House of Commons. In 1834 the Navy co-operated at the capture of Karachi which did not prove a very onerous service.

The capture of Aden in 1839 is notable as the first conquest by British arms during the reign of Queen Victoria. The expedition was but a small one, but the results obtained were out of all proportion to its size. The plan of campaign was that the ships should bombard Sirah and the town while the troops were landed on the eastern side. The Queen's ships on the one side and the Company's on the other soon began to demolish the fortifications. As

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The China War of 1840 is too long a story to embark upon here; but both the Royal and Indian Navies played an important part in the attacks on Chusan, Chinhar, Tsekee, Chapoo, Worsung, Canton, etc. On the motion for a vote of thanks in the House the Duke of Wellington spoke of the attack on Canton as unprecedented in the naval and military history of the country. Sir Willoughby Cotton, Commander-in-Chief of Bombay, made allusion to the service of the Indian Navy in the following terms:—"While thanking them on behalf of the British Navy, he bespoke their good feelings on behalf of a branch of the public service, though less considerable in number, not inferior in gallantry and devotion—he meant the Indian Navy. He had had occasion to remark the service and gallant actions performed by the officers of the Indian Navy in the Chinese war."

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At Miani the "Comet" lent valuable aid by preventing a large body of the enemy from crossing the river to join the main body. In subsequent engagements the flotilla played a not unimportant part and Sir Charles Napier expressed his satisfaction at its efforts. New Zealand is a far cry from India, but here too the Company's sloop "Elphinstone" was engaged in the capture of Ruapekapeka. Some 300 seamen also took part in the subsequent land operations.

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A subsequent naval expedition under another officer was not so successful. Neglecting the precaution of covering their advance by scouts the force blundered up against a stockade and the British were repulsed and forced to retreat with the loss of their guns.

THE PERSIAN WAR.

The occupation of Herar, in October 1856, by the Persians made it necessary for England to interfere; and an expedition was consequently prepared at Bombay. Sir James Outram, who was in England at the time, was nominated to the chief command, but, pending his return, Major-General Stalker proceeded in command of the first division of 5,000 men. Sir Henry Leeke was, at his own

not be required for any other purpose, and therefore if wanted in an emergency would probably not be so placed in the Transport Trains as to be obtainable. (g) Very efficient but expensive and would require extra transport, the inner rubber bags being also very liable to deteriorate in tropical climates. They belong more to the Bridging Train and seem to come under the category of Strategic Bridging Apparatus rather than to what may be termed Tactical Bridging Apparatus always in possession of units.

A chance conversation with an officer in a railway train put me in possession of a fact which seemed to supply the required link. I remembered afterwards that I had seen the same fact mentioned in a circular from A. G. of India, dated 1892, but apparently the idea has never been gone into.

The circular in question states that—

"A waterproof bag hermetically sealed not only does not sink if filled with saddlery and kit, but will bear a certain amount of weight," rats or rafting materials not being procurable. One can picture the feelings of a man called upon to swim a river "large and swift," with arms, ammunition and entrenching tools round his neck; and even if the river were "small," there might be some competition to be numbered with those who were to pull themselves over by the rope, nevertheless the feeling of the general non-swimmers performing this same latter feat can be better imagined than described. Anyhow the crossing under these circumstances would probably take some considerable time. But if each man were in possession of a waterproof bag as described above, every man's kit would go over dry, and a few bags joined together would solve a great many of the difficulties of the river or indifferent swimmers.

The circular in question also says that the method consists of a canvas bag soaked in some waterproof mixture. My efforts to produce a waterproof mixture not having been a success, in attempting to come by a bag such as is described I had to fall back on the known waterproof materials. The bag required must be of a suitable size and in addition be strong, light, cheap and efficiently waterproof.

It must be not only waterproof but remain so under considerable pressure when in use, and must not deteriorate from disuse, nor wear out quickly with fair wear and tear. The known materials are—

- (1) Rubber composition sheeting
- (2) Tarpapers.
- (3) Rainproof fabrics for wearing apparel
- (4) Willesden canvas
- (5) Mullerined khaki.
- (6) Pawlins.

I rejected 1, mentally without trial as expensive and being rubber unsuitable in the tropics. 2, rejected without trial on account of its weight and expense. 3, 4, 5, 6, etc. rejected as not

stout enough; (4) rejected for weight and cost when really water-proof. I experimented with bags made of—

- (a) Milleraired khaki,
- (b) Messrs. Birkmyre's N. khaki.
- (c) " " N. prepared.
- (d) " " Double post office bag.
- (e) Two regimental pawlin ground sheets sewn together to form a bag.

Saddlery and men's kits were placed inside each bag, and the mouth tightly tied with twine. They were all placed in water and left to float.

After 20 minutes (e) had leaked all over and the contents were wet, although as a ground sheet this material is efficient.

After four hours the remainder *a*, *b*, *c*, *d*, were opened, and the contents were dry; (a) appeared to be soaked through, but the contents were not wet however.

Before the I. G. Cavalry in India one of each of the bags (*a*), (*b*), (*c*), (*d*) was filled with saddlery and kit and used as a float, on which a sowar was towed across a stream. In this case the sowar naturally clung somewhat tightly to the bag in his endeavours to keep his balance and remain on the top side, which to my surprise he succeeded in doing in each case. Had the stream been broader I do not think he would have been successful; and to a non-swimmer the bag used in this way would have afforded the same amount of satisfaction as would Skobelof's rope.

The result of the unavoidable rough handling the bags received was that the kit in all of them was damp in various degrees. Whether the water had been forced through the material, or whether it had got in at the mouth in each case, I am not prepared to say. Judging by subsequent experiments with the same bags, and by the fact that the mouth of each was in this case well under water, I think it was by the latter that the water got in. The buoyancy of the bags was not impaired in any way however.

The comparative weights, etc., of these bags were—

	Weight.	Size.	Cost.	
			Rs.	
(a)	3lbs.	6' x 22"	2-8-0	Contents considerably wet.
(b)	3lbs.	5' x 2' 10"	5-0-0	Contents damp (slightly so).
(c)	3lbs.	5' x 2' 10"	4-8-0	Ditto.
(d)	6lbs.	4' x 2' 10"	8-8-0	Contents practically dry.

(a) retired from the contest as not up to standard.

(d) retired, having completely demonstrated the truth of the proposition and its practical possibilities, but at the same time being put out of court on account of weight and cost.

The question which now presented itself naturally was—if one N. khaki bag filled with saddlery and kit will support a sowar, what will 5 such bags support as a raft?

The answer is given in the following experiments. The contents of each bag are shown in photo. No. 1, also a bag filled in the



same photo, photo. No. 2 shows the formation of the rat



In an experiment not photographed, 5 saddle filled bags carried 4 sowars in drill order, or 16 sets of saddlery; estimated weight about 600 lbs. men, or 800 lbs. saddlery. The same bags filled with grass carried 8 men with a large freeboard.

In photo, No. 3 the 5 bags (saddle filled) are carrying 15 sets of



saddlery or 750 lbs. The weight of a set of saddlery averaged 50 lbs.; the weight of a bag filled with saddlery and men's kit averaged 80 lbs.

The smaller capacity in this instance is owing to the loss in bulk of some bags due to bad filling and tight lashing--see photo No. 2.

In photo. No. 4 the bags are grass filled and are carrying 8 men but



with not much to spare. The bags were not so full of grass as on the previous occasion when 8 men were carried with a large tree board.

It is evident that the load which can be carried varies according to the way the bags are packed and lashed, and that although grass filled bags will carry double the number of men that service filled bags will carry, yet they will not carry double the number of sets of soldiery. The reason probably is that 8 men can distribute their weight over the whole area of the raft, whereas 30 sets of soldiery will not go easily on to the raft, and the weight gets into a pyramid on the centre. Therefore, before calculating a full load on grass filled bags it would be as well to adopt the lower figures of men or soldiery, or to experiment with a larger and heavier raft, in order to ascertain its maximum capacity.

A Native Cavalry Squadron consists of 120 soldiers. To make of a native unit of soldiery 120 sets of 6 bags per man, or 20 tons, formed by the soldiers packed in 120 bags. The remaining 3 squadrons of the regiment amount to 360 sets of 6 bags, or 216 tons, to ferry their soldiery, arms, and kit over in turn. The amount to be ferried over the river by each Squadron is—

Soldiery	120 x 50 lbs.	6000
Men's kit and ammunition	120 x 50 lbs.	6000
Rifles, sword and lance	120 x 20 (rather less)	2400
Total		12000 lbs.

Referring to photo. No. 3 the load there are 750 lbs. on 5 bags, hence a load of 600 lbs. on 6 bags is on the safe side. Each raft then can take—

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request, placed in command of the Indian Navy Squadron, thus superseding the Commodore in the Persian Gulf. Ethersey was very down-hearted in consequence and the supersession in all probability caused him to take his life subsequently.

The following were the ships of the Indian Navy employed in the war:—"Assaye," "Falkland," "Semiramis," "Ferooz," "Punjaub," "Ajdaha," "Berenice," "Victoria," and "Clive." Twenty-three transports were chartered and, in addition, the P. and O. Company's "Precursor," "Pottinger" and "Chusan," with three steamers of the Bombay Steam Navigation Company all in charge of Commander Macdonald, with a staff of Indian Navy officers as agents for transports. Most of the troops were embarked at Bombay; but H.M. 64th Regiment and the 20th Bombay Native Infantry, stationed at Belgaum, were put on transport at Vingorla, the 3rd Cavalry at Porebunder and the 2nd Baluch Battalion, 2nd Europeans, and a battery of artillery at Karachi. On the 8th of November five ships, with a division of transports, sailed for the Gulf, followed on the 11th by the "Clive" with another division, and on the 13th and 15th by other ships. Part of the expedition touched at Muskat, and by the 24th all had reached the rendezvous at Bandar Abbas. On the 29th the first of the three divisions of transports arrived at Bushire, this being the first intimation the Governor received of the approach of the force. He at once inquired of Commander Jones as to the object and destination of the expedition. The General answered him by producing Lord Dalhousie's Proclamation of War. The Governor deigned to give no reply; so on the 4th of December the British flag was hoisted at Kharrack, under a Royal statute, after an interval of sixteen years.

The occupation of Bushire was the first item in the programme; and the ships moved to a favourable landing place in Hallilah Bay, twelve miles south-east of the town. On the 7th of December the disembarkation began, under cover of the fire of eight gun-boats, which was directed on a body of the enemy in some date-groves who retired after some loss, including a chief. In two days the operation was effected without a hitch. On Sunday, the 9th, taking provisions for three days, the troops advanced against the strong fort of Reshire, four miles below Bushire. The "Assaye" opened fire at 1,700 yards' range, being unable to approach nearer, and then the troops stormed the position. Brigadier Stopford of the 64th and Colonel Malet, 3rd Cavalry, were killed, and three other officers were wounded. Commander Jones now proceeded to Bushire to summon the Governor to surrender, but the flag of truce was fired upon, and he returned to the fleet which had now arrived before Bushire.

At 8 o'clock on the 10th of December the warships took up their positions off the town, while the army moved against it on the land side. A redoubt commanding the wells, from which Bushire obtained its water-supply, was shelled by some of the gun-boats, and its garrison driven into the town. The ships then engaged the defences and at noon, after four hours' firing, the Persians

lowered their colours. After the surrender the Governor and garrison showed some hesitation in evacuating the town; but a reassuring note, coupled with the threat that if they did not do so the shelling would be renewed in half an hour, hastened their movements. The Governor, after rendering up his sword, was graciously received by the Admiral and General. At 4-30 P.M., the British colours were hoisted on the Residency flagstaff, and at sunset the British garrison moved into the town. The Governor was sent on board the "Punjaub" as a prisoner. Sir Henry Leeke sailed with the prisoners on the "Assaye" three days later. While running down the Gulf of Bassadore an Arab chief came aboard to offer the services of his tribe, representing that they would prefer British rule to that of the Shah; at the same time informing the Admiral that 3,000 Persian troops were near Lingah, contemplating an attack on the dépôt station at Bassadore. Sir Henry continued his voyage, and soon coming opposite the Persian camp opened upon it with his guns. The enemy replied; but shell caused much havoc in their camp and they soon retired. The "Punjaub" was left to safeguard Bassadore and a force of Marines was entrenched on the shore.

Sir James Outram now arrived and, on the 17th of January, with his staff started for the Gulf on the "Semiramis." A good number of the transports had returned to Bombay, and with fourteen others commenced to embark the second division of the 78th Highlanders, 23rd and 26th Bombay Infantry, a Light Infantry battalion, the 14th Dragoons, 1st Sind Horse, a troop of Horse Artillery and two Field Batteries, all under the command of Brigadier-General H. Havelock, C.B. The "Semiramis" reached Bushire on the 26th of January, and Sir James Outram marched with his force on the 3rd of February and occupied Borazjun, 46 miles from Bushire, unopposed. The return march was commenced on the 7th; and on the following morning the two armies met at Khushab, when the Persians were defeated with a loss of 700 killed; the British losses being 10 killed and 62 wounded.

Sir James Outram now prepared to attack Muhammara, where 13,000 Persians were assembled under the Shahzada. At the junction of the Karun with the Shatt-al-Arab the enemy had erected solid batteries, 20 feet thick and 18 ft. high, with heavy guns in embrasures commanding the latter river. At this time both General Stalker and Commodore Ethersey committed suicide. Reinforcements now began to arrive, and transports left in quick succession for the Shatt-al-Arab. General Jacob was left in command at Bushire. The position of the force was by no means secure, for it was known that a large force was within forty miles, and might take advantage of the absence of the main body to make an attack. By the 24th of March the force for the attack on Muhammara was assembled, and the ships, with the transports in tow, moved up to within four miles of the forts, where the final arrangements for the attack were made. From this point the enemy's defences were visible; and so strong

were they known to be that the officers of the French frigate "Sybille," who had just inspected them, expressed grave doubts as to the sufficiency of the force for the work in hand. Sir James Outram, after their capture, reported that everything that science and hard work could do had been done to prevent the passage of the Shatt-al-Arab. His plan of attack was that the ships of war should first shell the batteries and that, when the enemy's fire had been nearly subdued, the small steamers, with boats in tow, should pass rapidly upstream and land the troops two miles to the north, whence the attack upon the entrenched camp should be launched.

On the night of the 24th March a boat, with muffled oars, proceeded up river to select the position for a mortar battery; but found that the island which had been selected for the purpose was a swamp, and returned to the ships without having attracted attention. During the night a raft was made under Commander Rennie's supervision, for which a sad and speedy fate was prophesied by the Engineers. It was made of casks and booms, manned by the Bombay Artillery, and armed with two 8-inch and two 5½-inch mortars. The "Comet" towed it into position opposite the northern fort.

The 25th of March was occupied in transferring the troops to the boats. At night the enemy placed some guns opposite the ships and opened fire; but the "Assaye's" 68-pounders soon silenced them. The enemy kept up a fire all night, and some of their cavalry, in light blue uniform and white belts, were seen moving among the trees on the following morning, which broke cloudless and with just sufficient wind to make the conditions ideal for the gunners. The men-of-war proceeded up to the attack. "Ferooz," "Semiramis," "Clive," "Assaye," "Ajdaha," "Victoria," and "Falkland" were those engaged. The mortar raft opened fire at daybreak, at a range of 1,000 yards, which was too much for the 5½ inch. During the five hours their firing was kept up, it pitched over 100 shells in or around the forts. The other ships now took up a position at a range of 800 yards, and opened fire, followed a little later by the "Ferooz" and "Assaye," which came into action 300 yards from the north fort, the strongest work, and began firing 8-inch shell which were quickly replied to by the enemy. After one hour's cannonade the "Ferooz" and "Assaye" closed to within sixty yards of the works; the remainder of the ships astern. The "Victoria" soon joined the other two ships, but grounded and suffered much damage. At 10 A.M. the magazine in the north fort blew up, and three others quickly followed suit, when the enemy's fire slackened. The works were completely silent by one o'clock, and the boats with the troops moved up as arranged. The enemy now returned to their guns, and opened a fire with jingalls and musketry, while in reply the ships fired grape and canister into the embrasures. Parties of seamen now landed and stormed the forts, the troops in the meanwhile moving towards the entrenched camp, whence the enemy fled, leaving behind sixteen guns and their stores of all descriptions. The forts were a terrible sight, as a result of the bombardment, dead soldiers, dying horses, splintered

carriages, etc., all being heaped together in confusion. The Persian army lost 300 killed, including their leader Aga Jan Khan by their own confession, but as the Shah metamorphosed the defeat into a victory no reliance can be placed on these figures. Havelock referring to this action writes—"the Gentlemen in blue had it all to themselves and left us naught to do."

The British loss was ten killed and thirty wounded. This was due, firstly, to Commander Rennie's precaution in ranging trusses of hay round the bulwarks, which in the case of the "Ferooz" were found full of bullets in addition to 300 found buried in the ship's sides; and, secondly, to the fact of the close advance completely upsetting the Persian's calculations and their aim at the same time. The north battery mounted 18 and the south 11 guns, and a smaller fort between the north battery and the town 8 guns. The entrenchment, connecting this work with the fort, was crowded with men who kept up a heavy fire throughout the engagement. There were, in addition, several small batteries mounting a few guns on either bank of the stream. The force employed in working these batteries was formed of 600 regular gunners, assisted by the other arms of the service.

Colonel Edward Lugard, C.B., the Chief of the Staff, wrote to Commodore Young "expressing in warm terms the appreciation of Sir James Outram of the great service rendered by the Indian Navy, in reducing the strong batteries which the enemy had erected on the left bank of the Euphrates to defend their position at Mohamra, and so gallantly and effectually performed by the armed steamers and sloops of war (naming them) with their brave crews, commanded by Captains Rennie, Selbs, Grieve, Manners, Adams, and Lieutenants Tronson and Worsley, that nothing was left for the army to do, after being conducted by the Navy past the silenced batteries, than to land and take possession of the enemy's entrenched camp." The Government of India were very complimentary to the Indian Navy for the part they played in this operation.

Sir James Outram now gave instructions to Commander Rennie of Burma fame, to "steam up to Ahwaz, and act with discretion according to circumstances."

Ahwaz is on the left bank of the Karun, one hundred miles above its junction with the Shatt-al-Arab. Near it two dams are thrown across the river, through which the stream flows in rapids; the river here is only passable for boats drawing a few feet of water and, on account of the strength of the current, is a matter of difficulty even for them. At Ahwaz the river is about one hundred yards in width, with low islands in the centre of the stream. As the Karun bends at this point the position is very strong, and at this time was defended by 7,000 Persians and numerous horsemen who occupied a ridge a few hundred yards from the bank. To solve the problem given him Rennie had 300 men from the 64th and 78th Regiments, three steamers, three gun-boats, each carrying the 24-pounder howitzers, and three ship's boats with guns and

European crews. How Captain Rennie performed this service is best described in the words of the despatch :—

"I have much satisfaction in announcing to you the complete success of the expedition which left Muhammara about midday on the 29th of March, under the command of Captain Rennie, Indian Navy, and of which the political direction was committed to my (Captain Kemball) charge. After quitting Muhammara the first traces we discovered of the enemy were at a point about thirty miles up the rivers to which our attention was directed by the remains of fires, shreds of clothing, etc., indicating a recent bivouac. There we anchored for the night, a little before sunset. About 2 P.M. on the following day we again fell upon the track of the enemy, at Labaort-al-Humeyrah, where they appeared to have bivouacked in comparative order, and, having parked their guns, we were enabled to determine their number to be five. In our further progress towards Ismailiyeh, where we came to an anchor at 8 P.M., we, for the first time, entered into communication with the inhabitants of the country, from whom we learnt that the Persian Army had passed up the opposite bank on their way to Ahwaz two days before, and that, at Subaut, they buried Aga Jan Khan, killed at Muhammara. Leaving Ismailiyeh at 5 A.M. on the 31st of March, we reached Oomarra about 3 P.M., where we ascertained positively that the Persian Army had reached Ahwaz the previous morning. Time being of importance, the vessels resumed their progress towards Ahwaz, now distant only fifteen miles, at 3 A.M. on the 1st of April. At 7 we first observed the enemy's cavalry vedettes (who retired at our approach) stretching along the right bank; and having made good our advance to within $2\frac{1}{2}$ miles of their position, we could clearly discern their battalions of infantry, with a large body of horse on the right flank, crowning a low range of hills of sandstone formation which trended westward in a direction at right angles to the river. Here, in the view of the Persian force, we overtook a boat carrying a disabled gun, and took possession. Some time was now occupied in reconnoitring the country, and there being reason to believe either that Ahwaz had been totally abandoned, or was so weakly garrisoned as to be liable a *coup-de-main*, an attack upon the town was speedily determined on.

The details of the plan will doubtless be reported to you by the naval and military commanders; but I may be permitted to observe that its adoption fully justified the previous reputation of Captain Rennie for daring and intrepidity, while the judicious disposition of the small force under the command of Captain Hunt, of H.M.'s 78th Highlanders, insured its successful execution. The gun-boats having taken up the position assigned to them under the shelter of an island within range of the enemy's camp, the troops landed, and were formed up in a manner to assume the appearance of 1,500 men rather than 300, to which number they were in fact limited, and, at the same time, Captain Rennie proceeded in person in the "Comet" to support the former, and, as far as possible, to

cover the march of the latter. As we advanced the last of the enemy's piquets were seen to retire on the main body. The battalions on the heights gradually disappeared, and one hour later, when the occupation of the town had been effected, we descried the whole Persian Army, with their rear not 1,200 yards distant from us, in full retreat on Dizful. Among the wheeled vehicles the private carriage of the Shahzada was clearly discernible. I must not omit to mention that twice, as the troops proceeded, the enemy endeavoured to bring a gun to bear on them, and, as often, the steady and accurate fire of the gun-boats compelled him to relinquish the attempt. On our approach to the town, a number of the inhabitants came out to meet us, with proffers of entire submission and devotion to the British Government. They conducted us to the different stores of grain and flour, and further delivered up to us 230 sheep, some 50 mules, and 150 new stand of arms in cases, and having the Tower mark. The sheep, arms, and mules Captain Rennie caused to be shipped on board of the steamers, but the grain I distributed among the people and outside Arabs.

Situated as they were in a position remarkably strong by nature, the precipitate retreat of the Persian Army before a mere handful of British troops can only be explained by the panic inspired by the defeat at Muhammara, by their inability, from the want of boats, to effect the passage of the river, by the bold front assumed by the expedition, and, finally, by the fact, which would have weighed probably with better troops than themselves, ignorant of our deficiency in field guns, that the occupation of Ahwaz enabled us to turn their flank, and thus effectually to take their position. The advantages occurring to us cannot, I think, be over-rated. Already had they commenced to entrench themselves, and had made arrangements for the arrival of reinforcements, and for the supply of stores and provisions from Shuster and Dizful: as it is, the loss of their grain at Ahwaz, which in the interim would have maintained the army for 15 or 20 days, will not only occasion much loss and suffering on their retreat, but, by driving them to a distance, will destroy their political status in the country, and, for the present at least, deprive them of any control over the inhabitants."

The country traversed by this expedition was the ancient Susiana through which Alexander marched on his return from India. The force returned to Muhammara on the 4th of April and Captain Hunt thus wrote its epitaph:—"Thus closed the operations of a most successful raid, adding another laurel to the gallant sailor who conducted it; and the little party, both blue and red jackets, and of all arms, associated on the service (especially on the 'Comet') separated with regret and will not readily forget the expedition up the Karun." Hunt died of cholera in Monghyr during the Mutiny. The conclusion of Peace at Paris ended this war and many complimentary orders were passed.

OCCUPATION OF PERIM.

Though hardly perhaps to be classified as an expedition, and although no fighting was entailed, it may be of interest to record the history of the occupation of Perim as a coaling station. The French were the first to land on the island in 1738 after the bombardment of Mocha. The British sent a small squadron with 300 troops in 1799 and took formal possession on the 5th of May. In September however it was again evacuated, partly on account of water difficulties, and partly because in those days no guns were of sufficient range to command the Straits. Steam navigation in the Red Sea in the meanwhile greatly increased and it was considered advisable to erect a light-house to make the island more easily visible. We were only just in time for the same idea was passing through the minds of the French. An American brig was the first to give us an inkling of the project and Brigadier Coghlan, who commanded at Aden, did not allow the grass to grow under his feet. He had repeatedly pointed out the strategical importance of Perim, whose harbour will contain a squadron of ironclads. Early in January 1857 the "Mahi" was instructed to quietly take possession without any fuss, and to take 50 Sappers to put up the required buildings and act as a garrison. The story may best be told in Sir William Coghlan's own words:—

"Our final occupation of Perim would take us back to 1799, a period to which your question does not refer. You mean the re-occupation in January 1857, that term being employed diplomatically, as giving some colour to our proceeding. In reality we had no legal claim to the island either in 1799 or 1857; we occupied and re-occupied. Now with regard to my share in the second occupation, I am familiar with some of the stories which are current as to its mode, and I have several times, when an unusually extravagant one has come before me, half resolved to spoil it by stating the facts, for I chafed under the imputation of the clever trick with which I was credited, but this good resolution was never carried out, and my alleged smartness continues as the stock story related on board every steamer that passes the Straits, with divers variations according to the imagination of the narrator. Now, as I shall show, there was no trick at all in the proceeding, which was one of prompt and (I may say it) of intelligent action, and nothing more. Under the title of "Political Resident and Commandant," I administered the Government of Aden from 1854 – 63. During the years 1855-56, the French were remarkably busy in the Red Sea: they had their vessels of war poking about every nook and corner of its southern end, in search of a suitable spot for a settlement. They tried the Camarans first, afterwards the village of Obokh and various other places I do not now remember. Of course it was my duty to keep a watchful eye on their proceedings, and to report them to Government. I was anxious about Perim. It would have been a great mortification to the British Government to have had the

French flag flying there. Hence I addressed the Government at Bombay in urgent terms. I have no copy of my letter, but a private letter of Lord Elphinstone to me, dated Bombay, the 3rd of October 1856, says:—"Your report about Perim is also a most interesting one, and I have sent it home by this mail to the Secret Committee, with a very strong recommendation that we may be allowed to occupy the island, which, in the event of the ship canal being made through the Isthmus of Suez, must become a place of very great importance." There you have the origin of the re-occupation (as we termed it). On the 17th of December 1856 Lord Elphinstone wrote me a confidential letter, enclosing the Secret Committee's despatch in reply, directing the occupation, which was accomplished, I think, on the 12th of January 1857, by Lieutenant Templer, in the "Mahi." But during the interval (the 3rd of October 1856 and the 12th of January 1857) I was made uneasy by a report, from reliable sources, that a certain French brig-of-war was preparing to start from Reunion, for the purpose of taking possession of Perim! And sure enough on the 10th or 11th of January 1857, that vessel arrived at Aden *just as Templer was about to leave for the island*, under the instructions which I had already issued to him on the authority of the Government at Bombay and the despatch of the Secret Committee. Instantly I packed him off, and the thing was done.

The French Captain made no communication to me as to Perim: all he said was that he was going to the Red Sea, and had put into Aden to repair some damage he had sustained in a gale off Guardafui. But for this accident, he would probably have passed Aden and got to Perim before Templer got there in the "Mahi"! The "Nisus" was a heavy brig of eighteen guns (sailing only). She had sprung her bowsprit and foremast, and required some iron forgings, which could not be made on board. I cheerfully gave all the assistance asked for. I went off to the vessel and arranged that my arsenal should forge the iron bands according to model, and I had the satisfaction of seeing the Frenchman dismantle his wounded spars for the necessary repairs.

There you have, very briefly, the bare facts, with none of the fun of the various stories which have sprung out of them. The dinner to the French Captain and officers *may* have been given, though I have no particular recollection of it, but it is likely they did dine with me; and as to the champagne, that also is likely, as I always kept a good brand. But there is no foundation for the story that I first intoxicated my guest, and then "pumped" him, and sent off at dead of night to forestall him! In reality, Perim was not named between us. I had accomplished my object, and was satisfied, and the Frenchman was too late! In due time the little garrison was located, the requisite buildings erected, provisions supplied, and a light house built. Perfidious Albion got soundly abused for a time, till her perfidy was obliterated by some other occurrence, and Perim remains a British possession. The Royal Navy had nothing whatever to do with the matter. Captain Pullen, in the "Cyclops,"

OCCUPATION OF PERIM.

Though hardly perhaps to be classified as an event, although no fighting was entailed, it may be of interest in the history of the occupation of Perim as a coaling station. The British were the first to land on the island in 1738, at the invitation of Mocha. The British sent a small squadron, and took formal possession on the 5th of May, 1840. It was again evacuated, partly on account of the smallness of the island, partly because in those days no guns were available to command the Straits. Steam navigation, however, had meanwhile greatly increased and it was found that a light house to make the island more useful was just in time for the same idea was suggested by the French. An American brig was sent to look up the project and Brigadier Coghill, who was then in command, not allow the grass to grow under his feet, and he pointed out the strategic importance of the island, and contained a squadron of men, and was instructed to quietly to take 500 Suppers to put up a garrison. The story may be told in his own words:—

Our final occupation was a period to which you may refer to occupation in July, 1840, as giving us no legal claim to the island and re-occupied in November, 1840. I am for the first time to its mode and I have to say one has to be careful for the latter.

I was once told a large party of every ship going to the island was not to be seen.

I may say that the British were the first to occupy the island.

On the 22nd of the month of May, 1840, the British sent a small squadron, and took formal possession on the 5th of May, 1840. It was again evacuated, partly on account of the smallness of the island, partly because in those days no guns were available to command the Straits. Steam navigation, however, had meanwhile greatly increased and it was found that a light house to make the island more useful was just in time for the same idea was suggested by the French. An American brig was sent to look up the project and Brigadier Coghill, who was then in command, not allow the grass to grow under his feet, and he pointed out the strategic importance of the island, and contained a squadron of men, and was instructed to quietly to take 500 Suppers to put up a garrison. The story may be told in his own words:—

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in the centre. There were besides the hospital, all strong for defence. The numbers were unknown, but the sepoys were quite drawn up in line, ready to receive the attack. The mosque, which formed their centre, was strongly held, and the rear was sketched in.

The commanding the Native Infantry and the Lieutenant of the Artillery, went forward to persuade the men to lay down their arms; but before they had gone far a volley showed the futility of the attempt. The sailors, who had formed line, the howitzers on their left, replied with a volley which did great execution. The order was now given to charge, but the sepoys refused to occupy the barracks, especially those on the embankment. The sailors followed and plied their bayonets freely, but the Pandies refused to surrender and sought the cover of the loop-holed walls. Another party occupied the mosque and tomb, while the howitzers engaged the Pandies. Many sepoys were killed in this part of the garden, the sailors relying upon the cold steel. Quarter was not asked or offered, it was fight to the death with “Cawnpore” ringing in their ears.

After half-an-hour's stiff fighting the buildings were carried, though not without considerable loss, chiefly incurred while leaving the barracks on the embankment. The sepoys now gathered for their last stand round the 9-pounder which was still in action; and the sailors, reforming behind the embankment, prepared to charge down upon them. Mr. Mayo, who was awarded the Victoria Cross for his gallantry, led twenty of his men on full speed direct for the gun. At the same moment the party from the mosque appeared upon the sepoy's left flank when they abandoned the gun, which was turned upon them, and fled.

In less than three-quarters of an hour the sailors had beaten four times their number out of a very strong position. Forty-one sepoys were found dead in the Lal Bagh; while the sailors lost three killed and sixteen wounded. The station was now considered perfectly safe, as it was not anticipated that the Chittagong regiment would desire to share the fate of their friends. Still every precaution was taken, and both sailors and volunteers were kept in readiness to turn out if required. The sepoys, however, had had enough, and fled into the wilds of Bhutan. The three prisoners who had been taken were duly tried by a drum-head court martial and hanged.

In February 1859 Lieutenant Lewis was ordered to Dibrugarh to act against the Acher hillmen; his detachment numbered two officers and sixty-two seamen. The remainder of the force was composed of thirty-five of the Assam Local Artillery with two 12-pounders and two mortars; 150 men of the 1st Assam Light Infantry battalion; and 150 auxiliaries. The whole was under the command of Lieutenant-Colonel Hannas, Assam Light Infantry, and the following is his report of the operations:—“I have the honour to acquaint you that the expedition under my command reached the vicinity of Pashee Ghat on the 26th instant and on the 27th instant (February).

were they known to be that the officers of the French frigate "Sybille," who had just inspected them, expressed grave doubts as to the sufficiency of the force for the work in hand. Sir James Ostram, after their capture, reported that everything that science and hard work could do had been done to prevent the passage of the Shatt-al-Arab. His plan of attack was that the ships of war should first shell the batteries and that, when the enemy's fire had been nearly subdued, the small steamers, with boats in tow, should pass rapidly upstream and land the troops two miles to the north where the attack upon the entrenched camp should be launched.

On the night of the 24th March a boat, with muffled oars, proceeded up river to select the position for a mortar battery, but found that the island which had been selected for the purpose was a swamp and returned to the ships without having attracted attention. During the night a raft was made under Commander Renne's supervision, for which a sad and speedy fate was prophesied by the Engineers. It was made of casks and beams, manned by the Bombay Artillery, and armed with two 8 inch and two 5½ inch mortars. The "Comet" towed it into position opposite the northern fort.

The 25th of March was occupied in transferring the troops to the boats. At night the enemy placed some guns opposite the ships and opened fire, but their Assyrian 68 pounders soon silenced them. The enemy kept up a fire all night and some of their cavalry, in light blue uniform and white belts, were seen moving among the trees on the following morning which broke cloudless and with a sufficient wind to make the conditions ideal for the gunners. The men of war proceeded up to the attack. "Feroze," "Samarra," "Chive," "Assaye," "Antelope," "Victoria," and "Faulkner" were then engaged. The mortar raft opened fire at daybreak at a range of 1000 yards, which was too much for the 5½ inch. During the five hours their firing was kept up it poured over 100 shells in or near the forts. The other ships now took up position at a range of 800 yards and opened fire. It was a little later by the "Feroze" and

"Assaye" which came into action 500 yards from the north fort, the strongest work, and began firing 8 inch shells which were quickly replied to by the enemy. After one hour's cannonade the "Feroze" and "Assaye" closed to within sixty yards of the works, the remainder of the ships astern. The "Victoria" then joined the other two ships, but grounded and suffered much damage. At 10 A.M. the magazine in the north fort blew up and three others quickly followed suit, when the enemy's fire slackened. The works were completely silent by one o'clock and the crews with the troops moved up unopposed. The enemy now returned to their guns and posted their men with muskets and rifles, but were unable to reply to the ships' fire, grape and canister into the batteries. Part of the seven men wounded and stormed the forts, the troops in the morning moving towards the entrenched camp where the enemy had a strong battery, strong guns and their stores of munitions. The forts were a total wreck as a result of the bombardment, the shells of the English ships entering

carriages, etc., all being heaped together in confusion. The Persian army lost 300 killed, including their leader Aga Jan Khan by their own confession, but as the Shah metamorphosed the defeat into a victory no reliance can be placed on these figures. Havelock referring to this action writes—"the Gentlemen in blue had it all to themselves and left us naught to do."

The British loss was ten killed and thirty wounded. This was due, firstly, to Commander Rennie's precaution in ranging trusses of hay round the bulwarks, which in the case of the "*Ferooz*" were found full of bullets in addition to 300 found buried in the ship's sides; and, secondly, to the fact of the close advance completely upsetting the Persian's calculations and their aim at the same time. The north battery mounted 18 and the south 11 guns, and a smaller fort between the north battery and the town 8 guns. The entrenchment, connecting this work with the fort, was crowded with men who kept up a heavy fire throughout the engagement. There were, in addition, several small batteries mounting a few guns on either bank of the stream. The force employed in working these batteries was formed of 600 regular gunners, assisted by the other arms of the service.

Colonel Edward Lugard, C.B., the Chief of the Staff, wrote to Commodore Young "expressing in warm terms the appreciation of Sir James Outram of the great service rendered by the Indian Navy, in reducing the strong batteries which the enemy had erected on the left bank of the Euphrates to defend their position at Mohamra, and so gallantly and effectually performed by the armed steamers and sloops of war (naming them) with their brave crews, commanded by Captains Rennie, Selbs, Grieve, Mannors, Adams, and Lieutenants Tronson and Worsley, that nothing was left for the army to do, after being conducted by the Navy past the silenced batteries, than to land and take possession of the enemy's entrenched camp." The Government of India were very complimentary to the Indian Navy for the part they played in this operation.

Sir James Outram now gave instructions to Commander Rennie of Burma fame, to "steam up to Ahwaz, and act with discretion according to circumstances."

Ahwaz is on the left bank of the Karun, one hundred miles above its junction with the Shatt-al-Arab. Near it two dams are thrown across the river, through which the stream flows in rapids; the river here is only passable for boats drawing a few feet of water and, on account of the strength of the current, is a matter of difficulty even for them. At Ahwaz the river is about one hundred yards in width, with low islands in the centre of the stream. As the Karun bends at this point the position is very strong, and at this time was defended by 7,000 Persians and numerous horsemen who occupied a ridge a few hundred yards from the bank. To solve the problem given him Rennie had 300 men from the 64th and 78th Regiments, three steamers, three gun-boats, each carrying the 24-pounder howitzers, and three ship's boats with guns and

European crews. How Captain Renard performed this service is best described in the words of the dispatch:

I have much satisfaction in announcing to you the complete success of the expedition which left Muhammara about midday on the 29th of March under the command of Captain Remond, Indian Navy and of which the political direction was committed to my (Captain Kumbhar) charge. After quitting Muhammara the first traces we discovered of the enemy were, at a point about thirty miles up the rivers, to which our attention was directed by the remains of fires, stired of clothing etc., indicating a recent bivouac. There we anchored for the night, a little before sunset. About 2 P.M. on the following day we again fell upon the track of the enemy at Laboul el Hameyeh, where they appeared to have bivouacked in comparative numbers, having parked their guns; we were enabled to determine their number to be five. In our further progress towards Isma'iyeh, where we came to anchor at 8 P.M., we for the first time entered into communication with the inhabitants of the country from whom we learnt that the Persians had passed up the rapps to Kani on their way to Ahwaz two days before, and that at 8 about they burned Aga Jan Khan k' d'ah; Muhammara. Leaving Isma'iyeh at 5 A.M. on the 31st of March we reached Omara about 3 P.M. where we ascertained positively that the Persian Army had reached Ahwaz the previous morning. Time being of importance, the vessels resumed their progress towards Ahwaz without any further delay, at 3 A.M. on the 1st of April. At 7 we first observed the enemy's advanced forces, we retired at once, making a short firing along the right bank, and having made good our withdrawal with 2 miles of the pursuing we could carry a considerable battery of infantry with a large body of horse on the right bank, covering a large range of hills, a small stream running in a westerly direction, and a large range of hills to the rear. Here, in the view of the Persians, we overtook a detachment of the enemy, and destroyed it at the expense of 800 men, who were pursuing the retreating army, and there being reason to believe that Ahwaz had been taken, that the enemy was so close, and that it was to be expected that they would attack upon the morning as speedily as they could.

the 1990s, the number of people who have been infected with HIV has increased dramatically. In the United States, the number of people living with HIV has increased from about 100,000 in 1985 to over 1 million in 2000. In the United Kingdom, the number of people living with HIV has increased from about 10,000 in 1985 to over 100,000 in 2000. In the United States, the number of people who have died from AIDS has increased from about 10,000 in 1985 to over 100,000 in 2000. In the United Kingdom, the number of people who have died from AIDS has increased from about 1,000 in 1985 to over 10,000 in 2000.

cover the march of the latter. As we advanced the last of the enemy's piquets were seen to retire on the main body. The battalions on the heights gradually disappeared, and one hour later, when the occupation of the town had been effected, we descried the whole Persian Army, with their rear not 1,200 yards distant from us, in full retreat on Dizful. Among the wheeled vehicles the private carriage of the Shahzada was clearly discernible. I must not omit to mention that twice, as the troops proceeded, the enemy endeavoured to bring a gun to bear on them, and, as often, the steady and accurate fire of the gun-boats compelled him to relinquish the attempt. On our approach to the town, a number of the inhabitants came out to meet us, with proffers of entire submission and devotion to the British Government. They conducted us to the different stores of grain and flour, and further delivered up to us 230 sheep, some 50 mules, and 150 new stand of arms in cases, and having the Tower mark. The sheep, arms, and mules Captain Rennie caused to be shipped on board of the steamers, but the grain I distributed among the people and outside Arabs.

Situated as they were in a position remarkably strong by nature, the precipitate retreat of the Persian Army before a mere handful of British troops can only be explained by the panic inspired by the defeat at Muhammara, by their inability, from the want of boats, to effect the passage of the river, by the bold front assumed by the expedition, and, finally, by the fact, which would have weighed probably with better troops than themselves, ignorant of our deficiency in field guns, that the occupation of Ahwaz enabled us to turn their flank, and thus effectually to take their position. The advantages occurring to us cannot, I think, be over-rated. Already had they commenced to entrench themselves, and had made arrangements for the arrival of reinforcements, and for the supply of stores and provisions from Shuster and Dizful: as it is, the loss of their grain at Ahwaz, which in the interim would have maintained the army for 15 or 20 days, will not only occasion much loss and suffering on their retreat, but, by driving them to a distance, will destroy their political status in the country, and, for the present at least, deprive them of any control over the inhabitants."

The country traversed by this expedition was the ancient Susiana through which Alexander marched on his return from India. The force returned to Muhammara on the 4th of April and Captain Hunt thus wrote its epitaph:—"Thus closed the operations of a most successful raid, adding another laurel to the gallant sailor who conducted it: and the little party, both blue and red jackets, and of all arms, associated on the service (especially on the 'Comet') separated with regret and will not readily forget the expedition up the Karun." Hunt died of cholera in Monghyr during the Mutiny. The conclusion of Peace at Paris ended this war and many complimentary orders were passed.

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I have much satisfaction in announcing to you the complete success of the expedition which left Muhammara about midday on the 29th of March under the command of Captain Renne, Indian Navy, and of which the political direction was committed to my (Captain Kendal) charge. After quitting Muhammara the first traces we discovered of the enemy were at a point about thirty miles up the rivers, to which our attention was directed by the remains of fires, stacks of things etc. indicating a recent bivouac. There we encamped for the night, a little before sunset. About 2 P.M. on the following day we again fell upon the track of the enemy at Ladoon, a Hamayathi, where they appeared to have bivouacked in comparative good ground, having parked their guns, we were enabled to determine their number to be five. In our further progress towards Ismaeyah, where we came to an anchor at 8 P.M., we for the first time entered into communication with the inhabitants of the country, from whom we learnt that the Persian Army had passed up the opposite bank on their way to Ahwaz two days before, and that at Subert they burned Agad in Khun Kood at Mahanmura. Leaving Ismaeyah at 5 A.M. on the 31st of March we reached Omeira about 3 P.M. where we ascertained positively that the Persian Army had reached Ahwaz the previous morning. Time being of importance, the vessels resumed their progress towards Ahwaz, now distant only fifty miles, at 3 A.M. on the 1st of April. At 7 we encountered the enemy's avowed forces, who retired at once upon a rocky stratum, leaving the right bank, and having thrown a considerable quantity of their guns, and having many of their men killed, the battery of infantry with a large body of horse on the right bank, coming within range of the shells of snail-shells, fired in which fired westward, nearly at a right angle to the river. Here, in the view of the Persian force, we overtook a battery of guns, and a good number of troops, some of which were now posted in front of the river, and others being reasons to believe, that the Ahwazi had been to try and resist, or was so weakly guarded as to be easily overpowered. The attack upon the latter was perfectly successful.

[illegible]

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OCCUPATION OF PERIM.

Though hardly perhaps to be classified as an expedition, and although no fighting was entailed, it may be of interest to record the history of the occupation of Perim as a coaling station. The French were the first to land on the island in 1738, after the bombardment of Mocha. The British sent a small squadron with 300 troops in 1799 and took formal possession on the 5th of May. In September however it was again evacuated, partly on account of water difficulties, and partly because in those days no guns were of sufficient range to command the Straits. Steam navigation in the Red Sea in the meanwhile greatly increased and it was considered advisable to erect a light house to make the island more easily visible. We were on a just in time for the same idea was passing through the minds of the French. An American brig was the first to give us an inkling of the project and Brigadier Coghlan, who commanded at Aden did not allow the grass to grow under his feet. He had repeatedly pointed out the strategical importance of Perim, whose harbour would contain a squadron of men-of-war. Early in January 1857 the "Mahar" was instructed to quietly take possession without any fuss, and to take 50 Sappers to put up the required buildings and act as a garrison. The story may best be told in Sir William Coghlan's own words:—

"Our final occupation of Perim would take us back to 1799, a period to which your question does not refer. You mean the re-occupation in January 1857, that term being employed dramatically as giving some colour to our proceeding. In reality we had no legal claim to the island either in 1799 or 1857, we occupied and re-occupied. Now with regard to my share in the second occupation, I am familiar with some of the stories which are current as to its mode, and I have several times when an unusually extravagant one has come before me, but resolved to spare it by stating the facts. I believed under the imputation of the cover-trick, with which I was credited, but this good resolution was never carried out, and my alleged swiftness of mind, as the story related on board every steamer that passes the Straits, with its various versions, coming to the imagination of the narrator. Now as I shall state what was not stated in the preceding which is short, prompt and true, I may say it of intelligent action and nothing more. Under the name of "Perim, Resident and Commandant," I had been sent by the Government of Aden in 1844, by the way. During the years 1855 to 1857 the French were exceedingly busy in the Red Sea, they had their vessels constantly picking up at every nook and corner of its southern extremity, and as I was spending a vast amount of my time in the Cape Coast Station, the charge of Oskan and various other posts I could not vary my mind. Of course it was necessary to keep a watchful eye on their proceedings, and to report them to the Government. This was a serious duty, but I was not free to make a general statement as to the French operations, and I was not

French flag flying there. Hence I addressed the Government at Bombay in urgent terms. I have no copy of my letter, but a private letter of Lord Elphinstone to me, dated Bombay, the 3rd of October 1856, says:—"Your report about Perim is also a most interesting one, and I have sent it home by this mail to the Secret Committee, with a very strong recommendation that we may be allowed to occupy the island, which, in the event of the ship canal being made through the Isthmus of Suez, must become a place of very great importance." There you have the origin of the re-occupation (as we termed it). On the 17th of December 1856 Lord Elphinstone wrote me a confidential letter, enclosing the Secret Committee's despatch in reply, directing the occupation, which was accomplished, I think, on the 12th of January 1857, by Lieutenant Templer, in the "*Mahi*." But during the interval (the 3rd of October 1856 and the 12th of January 1857) I was made uneasy by a report, from reliable sources, that a certain French brig-of-war was preparing to start from Reunion, for the purpose of taking possession of Perim! And sure enough on the 10th or 11th of January 1857, that vessel arrived at Aden *just as Templer was about to leave for the island*, under the instructions which I had already issued to him on the authority of the Government at Bombay and the despatch of the Secret Committee. Instantly I packed him off, and the thing was done.

The French Captain made no communication to me as to Perim; all he said was that he was going to the Red Sea, and had put into Aden to repair some damage he had sustained in a gale off Guardafui. But for this accident, he would probably have passed Aden and got to Perim before Templer got there in the "*Mahi*"! The "*Nisus*" was a heavy brig of eighteen guns (sailing only). She had sprung her bowsprit and foremast, and required some iron forgings, which could not be made on board. I cheerfully gave all the assistance asked for. I went off to the vessel and arranged that my arsenal should forge the iron bands according to model, and I had the satisfaction of seeing the Frenchman dismantle his wounded spars for the necessary repairs.

There you have, very briefly, the bare facts, with none of the fun of the various stories which have sprung out of them. The dinner to the French Captain and officers *may* have been given, though I have no particular recollection of it, but it is likely they did dine with me; and as to the champagne, that also is likely, as I always kept a good brand. But there is no foundation for the story that I first intoxicated my guest, and then "pumped" him, and sent off at dead of night to forestall him! In reality, Perim was not named between us. I had accomplished my object, and was satisfied, and the Frenchman was too late! In due time the little garrison was located, the requisite buildings erected, provisions supplied, and a light house built. Perfidious Albion got soundly abused for a time, till her perfidy was obliterated by some other occurrence, and Perim remains a British possession. The Royal Navy had nothing whatever to do with the matter. Captain Pullen, in the "*Cyclops*,"

visited the harbour and surveyed it, after we had occupied it and settled it ourselves: he made a passing reference to the survey which the officers of the Indian Navy had already completed, which was the survey made by Lieutenant Lamb, of the "Elphinstone," at my request.

THE INDIAN MUTINY.

During the Mutiny the Indian Navy rendered much important service.

For a considerable time the seamen formed one-third of the European garrison of Fort William, and supplied detachments for other important posts, from which the military had been withdrawn.

Others were formed into Police brigades, serving under officers of the Bengal Marine.

Important services were performed at Dacca on the 22nd of November 1857 by No. 4 detachment and two armed pinnaces under Lieutenant Lewis of the "Punjab"; the detachment numbered 85 seamen under five officers, and their commander being imbued with strong military instinct had them in first rate order.

On the night of the 21st of November intelligence was received that the 34th Regiment had mutinied at Chittagong, and had marched off, apparently to join the 73rd at Dacca. Accordingly Mr. Carnac, the Collector, called a council of war, chiefly composed of civilians, to decide what was to be done. Lieutenant Lewis was present, and it was arranged to disarm the sepoys the next morning. The volunteers were ordered to meet at the Bank at 4 o'clock on Sunday morning. The position was critical as the sepoys numbered 300, supported by 50 native artillerymen with two field-pieces and plenty of ammunition. The great stand by was the detachment of sailors, who were a fine and trustworthy body of men, well-commanded, well-drilled, and full of spirit and confidence. They were armed with the Enfield rifle, and three months' training had rendered them remarkably efficient. Still the odds against them were four to one, and they would need all their confidence and pluck.

The volunteers, composed of Englishmen, Armenians and Eurasians, were a useful lot and possessed of plenty of spirit.

Thirty volunteers had assembled soon after the appointed hour. At a distance of 100 yards was the sepoy guard over the treasury, and at double their distance, the sailors' barracks. One mile separated the civil station from the sepoy lines and between them lay the city, with its fanatical Muhammadan population. The treasury guard was speedily and quietly disarmed, and the volunteers took their place and prevented them from leaving the precincts. The sailors, with a few civilians and volunteers, proceeded to the Lal Bagh, in the hope of catching the sepoys napping. It was a large garden, containing many *pukka* buildings, some of which were utilised as barracks by the sepoys. Upon a broad embankment were built several barracks, loop-holed for musketry, and

commanding a mosque and tomb in the centre. There were besides several unoccupied barracks and the hospital, all strong for defence. How the news leaked out is unknown, but the sepoys were quite prepared for the visit, and were drawn up in line, ready to receive the sailors. The mosque, which formed their centre, was strongly held, the two guns being masked in rear.

The Officer Commanding the Native Infantry and the Lieutenant in command of the Artillery, went forward to persuade the men to lay down their arms; but before they had gone far a volley showed them the futility of the attempt. The sailors, who had formed line, with the howitzers on their left, replied with a volley which did great execution. The order was now given to charge, but the sepoys rushed to occupy the barracks, especially those on the embankment. The sailors followed and plied their bayonets freely, but the Pandies bolted and sought the cover of the loop-holed walls. Another party attacked the mosque and tomb, while the howitzers engaged the 9-pounders. Many sepoys were killed in this part of the garden, the sailors relying upon the cold steel. Quarter was not asked or offered, it was fight to the death with "Cawnpore" ringing in their ears.

After half-an-hour's stiff fighting the buildings were carried, though not without considerable loss, chiefly incurred while leaving the barracks on the embankment. The sepoys now gathered for their last stand round the 9-pounder which was still in action; and the sailors, reforming behind the embankment, prepared to charge down upon them. Mr. Mayo, who was awarded the Victoria Cross for his gallantry, led twenty of his men on full speed direct for the gun. At the same moment the party from the mosque appeared upon the sepoy's left flank when they abandoned the gun, which was turned upon them, and fled.

In less than three-quarters of an hour the sailors had beaten four times their number out of a very strong position. Forty-one sepoys were found dead in the Lal Bagh; while the sailors lost three killed and sixteen wounded. The station was now considered perfectly safe, as it was not anticipated that the Chittagong regiment would desire to share the fate of their friends. Still every precaution was taken, and both sailors and volunteers were kept in readiness to turn out if required. The sepoys, however, had had enough, and fled into the wilds of Bhutan. The three prisoners who had been taken were duly tried by a drum-head court martial and hanged.

In February 1859 Lieutenant Lewis was ordered to Dibrugarh to act against the Abor hillmen; his detachment numbered two officers and sixty-two seamen. The remainder of the force was composed of thirty-five of the Assam Local Artillery with two 12-pounders and two mortars; 150 men of the 1st Assam Light Infantry battalion; and 150 auxiliaries. The whole was under the command of Lieutenant-Colonel Hannas, Assam Light Infantry, and the following is his report of the operations:—"I have the honour to acquaint you that the expedition under my command reached the vicinity of Pashee Ghat on the 26th instant and on the 27th instant (February).

I proceeded from that point with a party to the attack of Pashee and the adjoining Meyong Abor village of Romkang, which was effectually carried out, and these two positions taken and completely destroyed by 4 P.M. when I returned to the camp, established at Pashee Ghat. I beg to state that the resistance made by the Abors to our advance was most obstinate and determined; which they were enabled to do through their thorough knowledge of the ground, their peculiar skill as marksmen and their formidable barricades and stockades, eleven in number, from the river bank, nine of which the enemy defended, and in three instances it was necessary to use a 12-pounder *æztimou* gun to open the way for the assault. The enclosed list of killed and wounded will show that we had to contend against a formidable enemy, armed with a powerful weapon in skilful hands; the strong nature of the defences keeping the attacking party unavoidably exposed, not only to the fire from the front, but from both flanks, and from trees and heights occupied by the enemy. However, all went down before the gallantry of the troops. The village of Romkang and three strong positions were carried at the point of the bayonet by our gallant band of Europeans, Indian Navy, and the advance guard, under Lieutenant Lewis and Davies, with Mr. Midshipman Mayo. The position of Pashee was taken by Major Reid and myself, the main body of native troops, with the local artillery and a 12-pounder howitzer gun. In such jungle positions, and with the prevailing practice of carrying their wounded, the loss of the enemy cannot be ascertained; but they must have suffered considerably, particularly in the defence of Romkang, where the conflict was hand-to-hand. I beg leave to express my utmost satisfaction with the conduct of the troops engaged, European and native. I would especially notice for your information, and that of the Right Honourable the Commander-in-Chief, the very gallant conduct of the Indian Naval Brigade, under Lieutenant Lewis, I.N., with Lieutenant Davies and Mr. Midshipman Mayo, I.N. Lieutenant Lewis had a narrow escape, an arrow fired at a very short distance lodging in his cap pocket. Lieutenant Davies, who gallantly led the advance guard throughout the whole of the operations of the day, was, I am sorry to say, severely hit in the left breast and left arm. Mr. Midshipman Mayo also, a gallant young lad, who was prominently forward on all occasions, was slightly wounded in the finger. I beg to report that the conduct of these officers was most gallant and exemplary." The fighting was undoubtedly very severe, as witness the losses; the small party of seamen alone losing four killed and twenty-one wounded, chiefly by arrows, the barbs of which were steeped in aconite poison. The path at the foot-hills was planted with *panjies*, small poisoned stakes, and the elephants carrying the mountain guns and ammunition were lamed by these. Twenty-two villages were represented in the fight which would give the enemy a strength of over 1,200. Lieutenant Lewis was so much impressed by their fighting qualities that he gave as his opinion that should any subsequent operations become necessary

European troops would have to be employed. Beyond complimentary orders Lieutenants Lewis and Davies obtained no rewards for their services.

The presence of the sailors at Dibrugarh was evidently gratifying to the inhabitants for at the time one of them wrote to a Bengal paper as follows:—"At present we feel tolerably secure, as there are upwards of 150 men of the Naval Brigade in the province, fifty-six of whom are at this station. Nearly all the men have ponies such as they are, and at all hours of the day you can see them galloping madly about at a neck-or-nothing pace. The Kutcherry has been converted into a temporary barrack for their accommodation, at one end of which they have fitted up a theatre. I attended a performance there the other night and was not a little amused: the women's parts are taken by huge, strapping, broad-shouldered he-fellows, with anything but feminine voices. However in the jungle one is not disposed to be over-fastidious. We have no ballet as yet, but I do not despair of our attaining even that last touch of civilisation.

The extra men, to make up the 150, had been sent up by Government, at the request of the tea-planters, on account of the threatening aspect of the Assam Light Infantry.

Prior to the expedition referred to above Lieutenant Davies had undertaken an expedition against the Abors. His force consisted of a party of seamen and 115 Gurkhas of the Assam Infantry under Captain Lowther. The expedition proceeded 20 miles up the Dehony in canoes when they landed, and attacked and burnt a village which offered a stout resistance, throwing poisoned arrows and spears and rolling down boulders which were tied with strips of bamboo, and let loose on the invaders underneath. The force was in a critical position, for the enemy communicated with one another by signal, never exposing themselves, and rolling down the rocks at the proper moment. The detachment was without food for 48 hours, and encamped among the boulders by the riverside. There was no respite at night, and in the morning Davies found his coat, which he had placed on the top of his rifle, riddled by arrows. To lure the enemy from the jungle he lay in ambush with a few crackshots, and sent on the remainder of his force. This stratagem succeeded, for the enemy came out into the open and paid the inevitable toll. The British suffered several casualties on this occasion, and Davies did a plucky act by sucking the poison from the wounds of some of his men who had been struck. The Abors suffered severely and it was ascertained that sixty-four were killed and many wounded.

One of the first detachments landed for service in Calcutta was drawn from the "Auckland," of China fame, and was commanded by Lieutenant Carew. It consisted of one hundred sailors and Marines—Bombay Artillerymen—with Midshipmen Brownlow of the "Auckland" and Cotgrave of the "Semiramis," and proceeded to Barrackpore, where it was attached to the 20th Horse field-battery.

One of Carew's first duties was to disarm the native artillerymen of the battery, and then he sat to work to drill his men. He says "I felt quite at home with the battery, but the 120 horses belonging to it I left entirely in the hands of their captain, who was attached to the battery with me, and it was agreed between us that he should drill and manœuvre when limbered up, but when unlimbered for action I should take command, being the senior officer." The two officers subordinated professional jealousies to the public weal, and worked together with praiseworthy unanimity. Subsequently a bullock battery was given him in exchange, as the English drivers were too heavy for the horses, and apparently the latter quickly discovered the difference for they soon got rid of their riders.

It was an anxious time for all until the arrival of H. M.'s 84th Regiment and other troops from China. Carew writes of this period:—"Very many an anxious night have I spent by my battery ready in a moment to limber up and march against the men whom we all knew were only waiting the signal to attack us. Now all anxiety was past, and stern retaliation upon those who caused it, was left for my battery to make; but even while I admitted the justice of the punishment, I could not but feel admiration for the coolness and courage displayed by the men who, lashed to my guns, with the port-fires lighted ready at the word to destroy them, could await that moment without the play or twitch of a nerve or muscle in face or body. On the second occasion of my having to execute some of the native officers, while waiting for the conclusion of General Hearsey's address to the assembled troops, one prisoner, lashed to the gun nearest to me, said in calm tone, 'Sir, may I speak to the Adjutant of my regiment?' I immediately despatched one of the gun's crew to make known his request. Upon the Adjutant arriving, he thanked him for coming, and said, 'There are some rupees due to me for pay, will you send them to my wife?' mentioning her village. To which the Adjutant replied, 'No; all property of a mutineer is forfeited to Government.' 'True,' said the prisoner, 'but this was due before I became a mutineer.' The next moment I saw the signal from the Major of Brigade, and gave the word that sent him to eternity."

In April 1858, Lieutenant Carew received leave to proceed up country, and was ordered to join Brigadier Corfield, who was operating in the Jagdaspur district. His force consisted of 110 sailors, with the same midshipmen as at Barrackpore, with two 9-pounders and two 5½-inch mortars. The first hundred and twenty miles was performed by rail, and for the remainder carts were provided for the baggage. The rebels were very active and had recently defeated a British force of 140 men of H. M.'s 35th Regiment, 50 European sailors of the Bengal Marine with two guns, and 200 Sikhs under Captain Le Grand, commanding the troops at Arrah. The force was seized with panic in the jungles and returned to Arrah, having lost 141 Europeans, including three officers, and three guns and ammunition. The Sikhs alone behaved well. On Lieu-

tenant Carew's arrival at Arrah he found there H. M.'s 6th Regiment, half a battery of Royal Artillery, a portion of Captain Peel's Naval Brigade, under Lieutenant Hay, R.N., and some Sikh cavalry and infantry. Sir Edward Lugard prepared to co-operate with Corfield and on the 6th of May cleared the rebels out of Jagdaspur. On the 11th another combined attack was made upon them, which is thus described by Brigadier Corfield:—"I have the honour to report for the information of Brigadier-General Sir Edward Lugard, K.C.B., that yesterday, after I had detached my cavalry, and two 9-pounder guns of the Royal Artillery, with you, on hearing firing in the direction of Juttowra, I immediately proceeded with the following force towards the jungle:—H. M.'s 6th Regiment, with drafts, 750 strong; Indian Naval Brigade, two 9-pounders, one 5½ inch mortar, and 110 men; Sikh Battalion, 60 men. After advancing about two miles, and just at the entrance of the jungle, the enemy opened fire upon me, on which I advanced three companies of infantry in skirmishing order, and opened fire with my guns. After considerable opposition, I brought up my right shoulder, driving the rebels towards my left, in the direction you had proceeded in with the cavalry and artillery; all firing on my right then ceased, as I had arranged with you that I should not advance into the jungle unless I heard long continued firing in the Juttowra direction. I then halted to watch the outlets of the jungle on this side; about half-an-hour afterwards the rebels again appeared in force, moving from our left towards the position they first occupied. On this I advanced, and reinforcing the skirmishers, closed round the village and stormed it. The rebels then retreated into other villages close at hand. I pursued them steadily, burning each village as I took it. At sunset I recalled my skirmishers, and was returning to camp, when the Brigadier-General's message to advance on Juttowra reached me. I have the honour to enclose a return of my casualties; it is impossible to estimate correctly the loss of the rebels, but I have every reason to believe it must have been heavy, more particularly on my left. I beg to state that I have every reason to be satisfied with the conduct of the officers and men engaged both with the infantry under Major Stratton. H. M.'s 6th Regiment, and the Indian Naval Brigade, under Lieutenant Carew, worked their guns admirably."

Lieutenant Carew, in his report to Captain Campbell, states that his guns were in action for four hours, his force having marched 14 miles under a burning sun, and before there was time to get a meal, started off again. The detachment lost three men from exposure. The heat of the Indian summer caused much sickness and, among others, Lieutenant Carew was invalided. Brigadier Corfield, in forwarding the proceedings of the Medical Board, wrote:—"I have this opportunity of requesting that on the expiration of his leave, Lieutenant Carew may be allowed to take command of the party he has left here, as he has proved himself both a most useful and zealous officer, and his men are in a fine state of discipline."

A detachment of 40 men and two guns, under Commander Batt, rendered good service at Buxar, in August 1858. Major Carr, Madras Rifles, reported as follows:—On the 11th of August, having been called on by Captain Broome, commanding Doomraon, for assistance, as a large body of rebels were moving on this post, I immediately sent off a troop and a half of the military train, in all 50 sabres, and 120 Sikh cavalry, under Lieutenant Ryall, the whole commanded by Captain Nason, Military Train; I proceeded myself during the night with two companies of the 84th, on elephants, and 50 Madras Rifles. On the 12th the enemy, said to be from 1,500 to 2,000, 800 of whom were sepoys, were reported to me to be posted in and around the village of Chowgain, about six miles off. I went out of Doomraon a short way in their direction, but finding the country so difficult for cavalry, for it was all enclosed, and having in all only about 150 infantry, of whom 100 only were Europeans, I returned, and sent into Buxar for the two Naval Brigade guns, which, with one other company of the 84th, arrived at 12 at night; this they were enabled to do by the fortuitous presence here of some bullocks and some drivers of the Bengal Artillery, which have been detained here by the closing of the communications. Thus reinforced, on the morning of the 13th, as soon as I could get certain information of the rebels, I marched out in the direction of the enemy on the Chowgain road. When about four miles out, the rebels were reported in front, advancing in three large bodies; on reaching the end of the enclosures I saw one large body posted in a tope behind rising ground, about 400 yards on my left front; I had a company of the 84th extended on that flank, and then advanced the guns which Captain Batt skilfully brought up. On the skirmishers advancing, the enemy began to retire, they were 500 or 600. Captain Batt then fired three shells at them, the last of which, set for 1,200 yards, fell amongst a number of them, killing two and wounding two others; this sent them on flying. Just as I began to advance on this body, word was brought to me that a body of 700 sepoys, and 150 sowars were passing my right flank to get round in my rear; I sent Captain Nason with his men to stop them, which he did eventually, as he did everything entrusted to him. As soon as I saw the rebels in front clear off, I retired along the road with two companies of the 84th, and half the Madras Rifles, to dislodge the rebels from a village they had seized. On the approach of the gun, etc., they all fled, throwing away their clothes and shoes. Knowing that a third body was working round on my flank, I could not venture yet to let the cavalry pursue; indeed I was told that the body on the left were getting round to Doomraon. I had sent a troop of Sikh cavalry to stop them some time before, and they were reported to me as having halted, and I afterwards heard that, on the report of the first gun, they went towards Arrah, plundering on the way."

On the 27th of September 1858, Acting-Master Chicken gained the Victoria Cross. Brigadier Douglas, C.B., was keeping up the

communications on the Grand Trunk Road, west of Dinapore. On the 27th of September a small column, under Lieutenant-Colonel Turner, had halted at Khurona for breakfast. Mr. Chicken, who happened to be in the vicinity, on his way to Buxar, attached himself to the cavalry under Lieutenant Baker which moved to attack the enemy in a village near Peeroo. On nearing the enemy Baker at first retired, and clearing the village and jungle, wheeled into line and charged the mutineers, who fled. In the charge Chicken greatly distinguished himself, and in the pursuit, swam his horse through a deep nala, and galloping through Kasauli, dashed into the sugar-cane and the jungle beyond, accompanied by some of the best mounted sowars. He suddenly found himself in the presence of 20 sepoy, and charged them without a moment's hesitation. He killed or wounded five but was dismounted, severely wounded, when four sowars came up and routed the remainder. These sowars received the Order of Merit.

The above is only a selection from the many occasions on which the Indian Navy rendered yeoman service during the Mutiny, but are those most suitable for the purpose of these papers, *e.g.*, the *co-operation* of the Army and Navy.

EXPEDITON AGAINST THE WAGHERS.

The Waghers were a race of pirates inhabiting the Okhamandel Peninsular, on the Katthiawar coast. The Indian Navy had been employed against them in 1820, with a body of troops under Colonel Stanhope, at the storm of Dwarka.

In 1858 the Waghers seized the island of Beyt, and, on the 3rd of April, defeated a force composed of two companies of the 10th Native Infantry and some details of the 16th N. I. and Marine Battation, with a loss of six killed and twenty-six wounded, which, while *en route* from Karachi to Surat, had attempted to carry the fort by escalade. The Waghers evacuated the fort the same night, but, under the impression that Government had their hands full with the Mutiny, reoccupied it and Dwarka the following year, and began to levy toll on the pilgrims who came to worship at the famous shrines. In September the Bombay Government fitted out an expedition, consisting of H. M.'s 28th Regiment, a company of Artillery, a detachment of Sappers, the 6th Native Infantry and 200 men of the Marine Battalion, the whole under Lieutenant-Colonel Donovan, of H. M.'s 33rd Regiment.

The Indian Navy supplied the "Ferooz," "Zenobia," "Berenice," "Victoria," "Clyde," and "Constance"; Commander Cruttenden of the "Ferooz" being senior naval officer. On the 29th of September the squadron sailed, escorting three transports with the troops, and arrived off Beyt, at the entrance to the Gulf, on the 3rd of October. The next day was spent in reconnoitring, while the boats cut out the native craft lying in-shore, and the ships took up a position half a mile south of the fort, whence the castle was bombarded throughout the day. Next morning, after a renewed bombardment, the

visited the harbour and surveyed it after we had occupied it and settled it ourselves; he made a passing reference to the survey which the officers of the Indian Navy had already completed, which was the survey made by Lieutenant Lamb of the "Explorateur" at my request.

THE INDIAN MUTINY.

During the Matruy the Indian Navy rendered much support and service.

For a considerable time the seamen formed one-third of the European garrison of Fort William and supplied detachments for other important posts, from which the money had been withdrawn.

Others were formed into Police brigades serving under officers of the Bengal Marine.

Important Services were performed at Duc on the 22nd of November 1857 by No. 4 detachment and two armed princes under Lieutenant Lewis of the 1st Punjab; the detachment numbered 85 seamen under five officers, and their commander being imbued with strong military instinct had them in most ready order.

On the night of the 21st of November intelligence was received that the 34th Regiment had mustered at Chittagong and had marched off apparently to join the 73rd at Dacca. Accordingly Mr. Carnac, the Collector, called a council of war, chiefly composed of civilians to decide what was to be done. Lieutenant Lewis was present, and it was arranged to disarm the sepoys the next morning. The volunteers were ordered to meet at the bazaar at four o'clock on Sunday morning. The position was critical, as the sepoys numbered 300, supported by 50 native artillerymen with two field pieces and plenty of ammunition. The great stumbling was the detachment of sailors who were a fine and trustworthy body of men well commanded, well drilled, and full of spirit and intrepidity. They were armed with the Ketchikan rifle and three months' practice had rendered them remarkably efficient. Still the odds against them were four to one, and they would need all the reinforcements and powder.

The volunteers comprised Englishmen, Americans and Europeans, were ill-trained, ill-equipped and possessed of poorly directed

Thirty volunteers had assembled soon after the appointed hour. At a distance of 100 yards was the survey grid over the treasury and at three other distances the survey trucks. One man separated from the station point the surveyors and between them lay the city walls situated at Mithras's temple site. The treasury grid was at the end of a path which the volunteers took to a point where they could stand without being perceived by the surveyors. The surveyors with a few assistants were positioned at the end of the path, in the middle of the surveying. It was a large gathering of about thirty people, some of whom were interested as far as the survey. Upon the other side of the wall with the surveyors there was a small building.

commanding a mosque and tomb in the centre. There were besides several unoccupied barracks and the hospital, all strong for defence. How the news leaked out is unknown, but the sepoys were quite prepared for the visit, and were drawn up in line, ready to receive the sailors. The mosque, which formed their centre, was strongly held, the two guns being masked in rear.

The Officer Commanding the Native Infantry and the Lieutenant in command of the Artillery, went forward to persuade the men to lay down their arms; but before they had gone far a volley showed them the futility of the attempt. The sailors, who had formed line, with the howitzers on their left, replied with a volley which did great execution. The order was now given to charge, but the sepoys rushed to occupy the barracks, especially those on the embankment. The sailors followed and plied their bayonets freely, but the Pandies bolted and sought the cover of the loop-holed walls. Another party attacked the mosque and tomb, while the howitzers engaged the 9-pounders. Many sepoys were killed in this part of the garden, the sailors relying upon the cold steel. Quarter was not asked or offered, it was fight to the death with "Cawnpore" ringing in their ears.

After half-an-hour's stiff fighting the buildings were carried, though not without considerable loss, chiefly incurred while leaving the barracks on the embankment. The sepoys now gathered for their last stand round the 9-pounder which was still in action; and the sailors, reforming behind the embankment, prepared to charge down upon them. Mr. Mayo, who was awarded the Victoria Cross for his gallantry, led twenty of his men on full speed direct for the gun. At the same moment the party from the mosque appeared upon the sepoy's left flank when they abandoned the gun, which was turned upon them, and fled.

In less than three-quarters of an hour the sailors had beaten four times their number out of a very strong position. Forty-one sepoys were found dead in the Lal Bagh; while the sailors lost three killed and sixteen wounded. The station was now considered perfectly safe, as it was not anticipated that the Chittagong regiment would desire to share the fate of their friends. Still every precaution was taken, and both sailors and volunteers were kept in readiness to turn out if required. The sepoys, however, had had enough, and fled into the wilds of Bhutan. The three prisoners who had been taken were duly tried by a drum-head court martial and hanged.

In February 1859 Lieutenant Lewis was ordered to Dibrugarh to act against the Abor hillmen; his detachment numbered two officers and sixty-two seamen. The remainder of the force was composed of thirty-five of the Assam Local Artillery with two 12-pounders and two mortars; 150 men of the 1st Assam Light Infantry battalion; and 150 auxiliaries. The whole was under the command of Lieutenant-Colonel Hannas, Assam Light Infantry, and the following is his report of the operations:—"I have the honour to acquaint you that the expedition under my command reached the vicinity of Pashee Ghat on the 26th instant and on the 27th instant (February).

I proceeded from that point with a party to the attack of Pashee and the adjoining Meyong Abor village of Romkang, which was effectually carried out, and these two positions taken and completely destroyed by 4 P.M. when I returned to the camp established at Pashee Ghat. I beg to state that the resistance made by the Abors to our advance was most obstinate and determined, which they were enabled to do through their thorough knowledge of the ground, their peculiar skill as marksmen and their formidable barricades and stockades, eleven in number, from the river bank, nine of which the enemy defended and in three instances it was necessary to use a 12-pounder howitzer gun to open the way for the assault. The enclosed list of killed and wounded will show that we had to contend against a formidable enemy, armed with a powerful weapon in skilful hands; the strong nature of the defences keeping the attacking party unavoidably exposed, not only to the fire from the front but from both flanks, and from trees and heights occupied by the enemy. However, all went down before the gallantry of the troops. The village of Romkang and three strong positions were carried at the point of the bayonet by our gallant band of Europeans, Indian Navy, and the advance guard, under Lieutenant Lewis and Davies, with Mr. Midshipman Mayo. The position of Pashee was taken by Major Reid and myself, the main body of native troops with the local artillery and a 12-pounder howitzer gun. In such jungle positions, and with the prevailing practice of carrying their wounded the loss of the enemy cannot be ascertained, but they must have suffered considerably, particularly in the defence of Romkang where the conflict was hard to hand. I beg leave to express my utmost satisfaction with the conduct of the troops engaged, European and native. I would especially notice for your information, and that of the Right Honourable the Commander in Chief, the very gallant conduct of the Indian Navy Brigade, under Lieutenant Lewis, R.N., with Lieutenant Davies and Mr. Midshipman Mayo, R.N. Lieutenant Lewis had a narrow escape, an arrow hitting at a very short distance lodging in his cap, pecked. Lieutenant Davies, who gallantly led the advance guard, lost a foot at the close of the operations of the day, was I am sorry to say severely hurt in the left breast and left arm. Mr. Midshipman Mayo also a grievous leg lad, who was prominently forward on action, as his was severely wounded in the hip. I beg to report that the conduct of these officers was most gallant and exemplary. The fighting was most costly, very severe, as witness the losses, the loss of a party of seven men, one losing a hand and twenty men wounded, the loss of six of the heaviest of our best rifled and breech-loading guns, the loss of a foot by a party of twelve, the saving of a stockade, and elephants carrying the breech-loading guns and a howitzer gun, all by these. Twenty-two of six companies of the 10th M. P. Coy. would give the enemy a strong and a 12 lb. howitzer gun. I was so much impressed by the fighting parties that I gave my own opinion that should my soldiers operate as they did, no necessity

European troops would have to be employed. Beyond complimentary orders Lieutenants Lewis and Davies obtained no rewards for their services.

The presence of the sailors at Dibrugarh was evidently gratifying to the inhabitants for at the time one of them wrote to a Bengal paper as follows:—"At present we feel tolerably secure, as there are upwards of 150 men of the Naval Brigade in the province, fifty-six of whom are at this station. Nearly all the men have ponies such as they are, and at all hours of the day you can see them galloping madly about at a neck-or-nothing pace. The Kutcherri has been converted into a temporary barrack for their accommodation, at one end of which they have fitted up a theatre. I attended a performance there the other night and was not a little amused: the women's parts are taken by huge, strapping, broad-shouldered he-fellows, with anything but feminine voices. However in the jungle one is not disposed to be over-fastidious. We have no ballet as yet, but I do not despair of our attaining even that last touch of civilisation.

The extra men, to make up the 150, had been sent up by Government, at the request of the tea-planters, on account of the threatening aspect of the Assam Light Infantry.

Prior to the expedition referred to above Lieutenant Davies had undertaken an expedition against the Abors. His force consisted of a party of seamen and 115 Gurkhas of the Assam Infantry under Captain Lowther. The expedition proceeded 20 miles up the Dehony in canoes when they landed, and attacked and burnt a village which offered a stout resistance, throwing poisoned arrows and spears and rolling down boulders which were tied with strips of bamboo, and let loose on the invaders underneath. The force was in a critical position, for the enemy communicated with one another by signal, never exposing themselves, and rolling down the rocks at the proper moment. The detachment was without food for 48 hours, and encamped among the boulders by the riverside. There was no respite at night, and in the morning Davies found his coat, which he had placed on the top of his rifle, riddled by arrows. To lure the enemy from the jungle he lay in ambush with a few crackshots, and sent on the remainder of his force. This strategem succeeded, for the enemy came out into the open and paid the inevitable toll. The British suffered several casualties on this occasion, and Davies did a plucky act by sucking the poison from the wounds of some of his men who had been struck. The Abors suffered severely and it was ascertained that sixty-four were killed and many wounded.

One of the first detachments landed for service in Calcutta was drawn from the "Auckland," of China fame, and was commanded by Lieutenant Carew. It consisted of one hundred sailors and Marines—Bombay Artillerymen—with Midshipmen Brownlow of the "Auckland" and Cotgrave of the "Semiramis," and proceeded to Barrackpore, where it was attached to the 20th Horse field-battery.

order was given to storm, and at 2 P.M. the troops were landed, under a heavy fire from the enemy, protected by the guns of the squadron. The boats' crews, with field-pieces, also landed and covered the advance of the troops. The attempts to escalate met with a heavy fire from the loop-holed curtains and failed. The face of the fort was covered by an entanglement of prickly pear, and it was resolved to withdraw the troops and resume the bombardment. The chief now offered to surrender, if the garrison was allowed to march out with its arms, but as unconditional surrender was the order, the flag of truce was hauled down. Soon after dark, however, the Waghers evacuated the fort which was occupied on the following day. It was wonderful that the garrison should have held out for so long, for the "Ferooz" alone fired 1,400 rounds. The walls were from 20 to 40 feet thick and 30 to 40 feet high; and in the unsuccessful assault the attackers lost one officer and 13 men of H. M.'s 28th Regiment, and one officer and 9 men of the 6th N. I. killed; and 2 officers and 33 men of the 28th, 10 of the 6th N. I. and 2 of the Marine Battalion wounded.

The "Zenobia" arrived at Bombay with the wounded on the 11th of October, and returned on the 14th to assist in the reduction of Dwarka, for which a second column of troops, under Colonel Scobie, marched by land. The squadron was reinforced by the "Clive," and proceeded to Dwarka off which the force was assembled.

A correspondent of the *Bombay Gazette* gives the following account of the operations:—

"In order to make Colonel Scobie's force, which was supposed to be about five miles inland, aware of our presence, the 'Ferooz' steamed in abreast of the town, and fired eight shells into it, this being the preconcerted signal, and then anchored to the north-west, nearly opposite to Roopon Bunder, which is $1\frac{1}{2}$ miles north of Dwarka. This is the only place where the troops could effect a landing, on account of the surf which runs all along the coast, with the exception of a few sheltered places. But there is rather an imposing looking fort there, and we noticed horsemen riding between it and the town, evidently making preparations to defend it; so the "Clyde" gun-boat, towing the 'Ferooz,' 'Berenice' and 'Zenobia's' first cutters, in charge of Lieutenant Wilson, anchored off it, and commenced firing, which was kept up for some time, when the boat's crews rushed up to the fort and took it, much to the surprise of everybody as it was expected to have been decided in the usual Wagher style, and the Colonel commanding the field-piece stated that he would not have landed there with less than a thousand men; so this was a feather in Jack's cap. On the afternoon of the next day, the troops disembarked, and in conjunction with Colonel Scobie's forces formed a circle round the land side of the town. I forgot to mention that as soon as the Jacks had taken the fort, Lieutenant Nixon, commanding the "Clyde" landed a 24-pounder howitzer, which afterwards harassed the enemy a good deal, disabling the gun they brought to the front, killing two, and wounding a good many. The first thing to be done was to disable the guns, of which they appear to have a good

many, and a 10-inch mortar. The artillery had gradually got their batteries to work, and for the last three days the "Ferooz" and "Zenobia" had been shelling the town. At first the military big-wigs were cautious about going to work, lest they should fire over on the troops on the other side; but, after seeing the practice that was made at Beyt by the ships, they ought to have had more confidence; however they appear to have recovered. The firing from the ships was heavier than the whole of the shore batteries put together. H. M.'s sloop "Clive" arrived on the 25th, when a Naval Brigade was formed, consisting of three Lieutenants—Sedley, commanding, Crockett from the "Ferooz" and Hall from the "Zenobia"—9 midshipmen and 120 blue-jackets. These landed on the 26th, and the next morning at once took up a position above 150 yards from the outer forts and temples, taking possession of a square-looking tower. They were not long left in peace here, for the enemy commenced a heavy fire of musketry, and after a short time brought a gun to bear on them. Before dark they had two officers, Lieutenant Hall and Mr. Midshipman Pulman, and four men wounded. They had brought a 12-pounder field-piece up with them, but it became disabled after a few rounds; so they had no means of silencing the enemy's guns, and there was no cover for them beyond that afforded at the back of the square tower, the single walls of which were too thin to resist round-shot, and there was barely room for 120 men. However, Lieutenant Sedley was determined to hold the position at all hazards, as it was an important one. That night the Waghers made an assault in two parties, one in front and one round by the breach under the high ground on which the town stands. They rushed on, yelling like fiends, but were repulsed with great loss—after killing one seaman and wounding five others. The man who was killed was almost cut in two and otherwise frightfully mangled. The number of the enemy killed is not known, but they were three hours carrying away their wounded. There must already have been a great number killed, as every night large fires were seen burning their dead. Yesterday two more wounded were added to the Naval Brigade casualties, in trying to take possession of an advanced fort. When I say trying, it was taken; and before you could make that popular exclamation 'Jack Robinson,' a midshipman was climbing to the top of the temple and in five minutes more the Union Jack was flying where the Wagher flag had been. The breastworks the enemy had built up were knocked down; the party then retired, as the place was too large, and in too crumbling a state to hold, and there was a heavy fire of musketry on them. The batteries are hard at work as I write and the ships will open fire again in a few minutes. On the evening of the 30th, the Waghers made a sortie on the sailor's battery, but were repulsed with severe loss. Early on Tuesday morning (1st November) they evacuated the fort, cutting their way through the piquets of the 28th Regiment, severely wounding one officer and three men. They passed close to the 28th camp, but the corps could do nothing towards intercepting them, owing to the darkness."

GUN *VERSUS* HOWITZER, IN THE HEAVY ARTILLERY OF A FIELD ARMY.

**A review of Major K. K. Knapp's "commended" essay in the
Journal of the Royal Artillery Institution.**

BY COLONEL F. G. STONE, *p.s.c.*

Major Knapp has, in the excellent essay under review, brought forward arguments for the abolition of a long range gun in the heavy artillery, and for its replacement by a heavy field howitzer: he regrets the necessity for reopening "the subject of heavy artillery armament, just at the time when the heavy batteries at home are being armed with a heavy gun of the most modern type, but it is unavoidable, since the question now is, *whether guns are any longer a necessary or suitable equipment for heavy artillery.*"

The arguments in support of the contention for a howitzer in lieu of a heavy gun appear so weighty and are so well put, that even a moderately critical reader is almost persuaded to accept them without further examination, and it is to guard against too hasty an acceptance of the views put forward that I propose to discuss, I hope without bias, the validity of the arguments adduced.

Major Knapp's initial argument is that a heavy long range gun was a necessary equipment for heavy artillery, only so long as the field artillery was armed with the 15-pr., but now "the comparatively short ranging 15-pr. has given place to the 18½-pr. quick-firing field gun, which is effective up to 7,500 yards—a range sufficient for all practical purposes in any theatre of war—and consequently much of the work, which has hitherto been assigned to the heavy guns on account of their long ranging powers, will in future be carried out by the field artillery."

The effectiveness of the 18-pr. shrapnel at 7,500 yards is however not to be accepted without comment, and the essayist has somewhat overstated his case. At present there is no fuze in the service which will burst the 18-pr. shrapnel at ranges over 6,200 yards; it is true that there is one now being experimented with, which will burst the shrapnel at ranges up to 7,500 yards, and there is no reason why it should not be successful. But a more serious matter is the fact that elevation cannot be given to the gun for ranges over 6,200 yards, without sinking the trail, and though this procedure might be successfully resorted to occasionally for ranges

even up to 7,000 yards, it is extremely doubtful whether the running out springs would work satisfactorily for continuous and rapid fire at any greater range. At an elevation of over 23 degrees which is required for a range of 7,500 yards, it is more than likely that the gun would be far from effective as a Q.-F. gun, even if it could fire continuously at a slower rate. The carriage was constructed to enable the gun to fire as a Q.-F. gun at ranges up to 6,200 yards, every 100 yards added to this means additional elevation in a rapidly increasing ratio, and a weight for the running out springs to *lift*, for which they were not designed.

It is obvious that on rocky or frozen ground this device of sinking the trail will not be practicable; at the battle of Mukden, for instance, it would have been absolutely impracticable, as a pick could make no impression on the frozen ground.

It will therefore be evident that, as I have said, the essayist has somewhat overstated his case; and it must be acknowledged that the 18-pr. could not on all occasions do the work of the 60-pr. at ranges between 6,200 yards and 7,500 yards, and therefore that the 60-pr. cannot be lightly dismissed even on the unproved assumption that 7,500 yards is a range sufficient for all practical purposes.

Let us now examine the essayist's argument, apart from the difficulties mentioned above with reference to sinking the trail, and consider the following questions without prejudice:—

(1) Is the 18-pr. shrapnel as effective as the 60-pr. shrapnel at 7,500 yards or at ranges approximating thereto?

(2) Is it necessary to consider ranges over 7,500 yards at all?

As regards (1):—

Let us consider the principal uses of long range shrapnel fire from guns: some of the most important are:—*In the attack*:

(a) for enfilading the enemy's artillery positions or infantry trenches;

(b) for attacking the enemy's supports or reserves, or other bodies of troops manœuvring in rear of the line of resistance; for "searching"; for "cutting off the point of attack" by means of cross fire.

In the pursuit, for attacking the enemy's main body, over the head of his rear guard.

In the defence, for causing the attacker to deploy at the maximum distance, and for compelling turning movements to be executed on a wide arc.

Now for all these purposes, the effect of the shrapnel will be directly proportional to the flatness of the trajectory, and to the remaining velocity at the time of bursting; in fact, the depth of the zone covered by effective shrapnel bullets will be a direct measure of the value of the fire.

The following table shows at a glance how the 18-pr. shrapnel compared with the 60-pr. shrapnel in those particulars which immediately affect the depth of the zone of effective shrapnel as well

as the time of flight and accuracy of shooting at the maximum range for the 18-pr., *viz.*, 7,500 yards.

Nature of gun.	Angle of descent.	Remaining velocity, f.s.	Time of flight, secs.	50°/c OF ROUNDS FALL IN.	
				Length, yards.	Breadth, yards.
60-pr.	18°50'	913	18-90	75-6	9-5
18-pr.	36°3'	704	27-74	77-0	7-5

The question of comparative accuracy may at once be dismissed, the difference between the shooting of the two guns in this respect being inappreciable, and almost literally "as broad as it is long."

The difference in the time of flight also is not a matter of great importance, but such as it is, it is in favour of the 60-pr.

The really important differences are in the angle of descent, which in the case of the 18-pr. is practically double that of the 60-pr.; and in the remaining velocity, which in the case of the 18-pr. is more than 200 f.s. less than that of the 60-pr.

In addition to the remaining velocity of the shell, we must consider that the bullets of the 60-pr. are 35 to the pound, against 41 to the pound in the case of the 18-pr.; this factor gives a sufficient "striking energy" at an appreciably longer distance from the point of burst.

We have no experimental data to go on, and it is not possible to calculate, with absolute precision, how much further the 60-pr. shrapnel bullet would range effectively after the burst of the shell than that of the 18-pr.; but it appears quite a moderate estimate to say that at 7,500 yards' range, the depth of zone covered by effective shrapnel bullets, will be twice as great in the case of the 60-pr. as in the case of the 18-pr.; the actual number of bullets which fall in this zone is dealt with later, it does not affect the question now under discussion.

If we compare the range tables of the two guns at shorter ranges, we shall find that, in respect to angle of descent, that of the 60-pr. shrapnel is roughly half as steep as that of the 18-pr. all through; and the difference in remaining velocity is greater in comparison, as the range gets shorter.

It is interesting to note that whereas the limit of the 18-pr. shrapnel is reached at 7,500 yards, because, beyond that range, the bullets would not have effective striking energy at 200 yards from the point of burst: the limit of the 60-pr. shrapnel, on the other hand, is fixed at 9,500 yards, simply because it was considered impracticable to employ shrapnel fire usefully beyond that range: the following table shows that there is no question of the shrapnel becoming ineffective owing to insufficient striking energy, and that even up to 10,400 yards, the accuracy is not gravely affected, while the angle of descent is still less than that of the 18-pr. at 7,500 yards.

Range 60-pr. B. L.	Angle of descent.	Remaining velocity, f. s.	50 % OF ROUNDS FALL IN.	
			Length, yards.	Breadth, yards.
7,500	18°30	913	75·6	9·5
9,500	28°30	869	81·3	14·2
10,100	32°35	864	93·8	16·3

It has been clearly demonstrated that the 18-pr. shrapnel is *not* as effective as the 60-pr. shrapnel at 7,500 yards, or at ranges approximating thereto, or in fact at any ranges, in respect to depth of zone covered by effective shrapnel.

We now have to consider (2) Is it necessary to consider ranges over 7,500 yards at all? Major Knapp thinks 7,500 yards "sufficient for all practical purposes in any theatre of war," owing to the difficulty of observation at "longer ranges."

It is however at ranges over 7,500 yards that heavy artillery expects to achieve its most important results: it will be readily admitted that enfilade fire is at once the most deadly and at the same time the most difficult nature of fire to obtain, owing usually to the impossibility of taking an enfilading position without coming so close to another portion of the enemy's line that the enfilading batteries are certain to be wiped out before they can establish an effective fire. But the long range of the 60-pr. enables a heavy battery to take a position for enfilade fire, so much further from the enemy's line, while still in prolongation of the line to be enfiladed, that what would be out of the question for a field battery is perfectly practicable for a heavy battery.

Many instances could be quoted from the Russo-Japanese War, in which long range shrapnel fire of heavy guns for enfilading the Russian artillery positions, when they could not be reached effectively in any other way, would have been invaluable. The two most notable of these were:—

(1) The attack by the Japanese II Army on the redoubtable Shou-shan-po position, before Liao-yang: in this case the Russian batteries were so admirably placed that nothing could touch them, and the Japanese were utterly unable to carry the position, until a successful night attack brought the 48 hours' fighting to a close just as the Russian Commander-in-Chief had issued orders to retire. Practicably the only vulnerable point in the position was the prolongation of the Russian right flank towards Wang-erh-tung; a heavy battery placed near this point could have enfiladed the whole line, at ranges of from 7,000 to 9,000 yards; closer ranges were impossible to obtain owing to the commanding hill on the Russian right flank which dominated the entire plain and was situated at a distance of 6,000 yards from Wang-erh-tung: this hill, though prohibiting a nearer approach to the Russian position, was altogether separate from the group of hills on which the main Russian artillery position was so cleverly concealed from the front, and was separated

therefrom by a plain 500 yards in width; the commanding hill, being in echelon to the rear of the prolongation of the artillery position, allowed a clear view to be obtained from the neighbourhood of Wang-erh-tung across the plain along the rear of the group of hills occupied by the artillery. There was however no heavy artillery available.

(2) Again at the battle of Ta-shi-chiao, the batteries of the Japanese right wing, though twice as numerous as those of the Russians, were unable even to locate the guns opposed to them, which swept all lines of approach so successfully that the Japanese frontal attack failed throughout the day in their portion of the field; and it was only by a costly night attack that the position was ultimately carried. In this case, there was a position near Sung-chia-tun in the Japanese centre from which the Russian artillery positions opposite the Japanese right could have been taken in enfilade by heavy artillery at ranges of from 5,000 yards to 8,400 yards. Here again however there was no heavy artillery available.

It would be easy to multiply instances in which effective fire at ranges over 7,500 yards would have been most valuable, but we have to meet the argument brought up against these longer ranges, owing to "difficulty of observation." Now this argument cannot be allowed to hold water for an instant; it presupposes that observation must always be from the position of the battery, whereas in practice such will seldom be the case at long ranges: there is in fact no limit to the proximity to the target of the battery commander, observation officer, or staff officer of artillery who may be controlling or directing the fire, except such as is imposed by the presence of the enemy, provided that telephone communication has been established between him and the battery: there is nothing new in this, it is part of our regular training in the heavy artillery; and towards the end of the Russo-Japanese War, Captain B. Vincent, R.F.A., tells us that "in the III Japanese Army, artillery officers were sometimes sent forward with hand shields and telephones, whose duty it was to keep so far as possible with the advancing infantry and to send back their observations to the line of guns."

Having dismissed the question of (1) the superiority of the 60-pr. gun in regard to depth of effective shrapnel zone at long ranges under 7,500 yards as compared with the 18-pr., and (2) the utility of firing at all at ranges over 7,500 yards, we pass to another point.

Major Knapp argues that "in carrying out any task, the field guns can fire more than three times as many shells as the 60-pr. guns without any greater proportionate expenditure of ammunition, and the effect of their fire should be greater on account of the larger number of bullets which are poured upon the enemy's position." As regards the greater "number of bullets," this only amounts to about 10 per cent, and at long ranges the harder hitting and deeper searching of the 60-pr. shrapnel bullets would probably fully compensate for their slightly smaller numbers.

A detachment of 40 men and two guns, under Commander Batt, rendered good service at Buxar, in August 1858. Major Carr, Madras Rifles, reported as follows:—On the 11th of August, having been called on by Captain Broome, commanding Dasmuon, for assistance, as a large body of rebels were moving on this post, I immediately sent off a troop and a half of the military train, in all 50 sabres, and 120 Sikh cavalry, under Lieutenant Ryall, the whole commanded by Captain Nason, Military Train. I proceeded myself during the night with two companies of the 84th, on elephants, and 50 Madras Rifles. On the 12th the enemy, said to be from 1,500 to 2,000, 800 of whom were sepoys, were reported to me to be posted in and around the village of Chowgan, about six miles off. I went out of Dasmuon a short way in their direction, but finding the country so difficult for cavalry, for it was all enclosed, and having in all only about 150 infantry, of whom 100 only were Europeans, I returned, and sent into Buxar for the two Naval Brigade guns, which, with one other company of the 84th, arrived at 12 at night; thus they were enabled to do by the fortuitous presence here of some bullocks and some drivers of the Bengal Artillery, which have been detained here by the closing of the communications. Thus reinforced, on the morning of the 13th, as soon as I could get certain information of the rebels, I marched out in the direction of the enemy on the Chowgan road. When about four miles out, the rebels were reported in front advancing in three large bodies, on reaching the end of the enclosures I saw one large body posted in a top behind rising ground, about 400 yards on my left front, I had a company of the 84th extended on that flank and then advanced the guns which Captain Batt skilfully brought up. On the skirmishers advancing the enemy began to retire, they were 500 or 600. Captain Batt then fired three shells at them, the last of which set for 1200 yards, fell amongst a number of them killing two and wounding two others, this sent them on flying. Just as I began to advance on this body word was brought to me that a body of 700 sepoys and 150 sowars were passing my right flank to get round in my rear, I sent Captain Nason with his men to stop them, which he did eventually, as he did everything entrusted to him. As soon as I saw the rebels in front clear off I retired along the road with two companies of the 84th and half the Madras Rifles to dislodge the rebels from a village they had seized. On the approach of the guns etc. they all fled throwing away their clothes and shoes. Knowing that a third body was working round on my flank I could not venture yet to let the cavalry pursue, indeed I was told that the body on the left were getting round to Dasmuon. I had sent a troop of Sikh cavalry to stop them some time before, and they were reported to me as having halted, and afterwards heard that on the report of the first gun they went towards Arrah, pausing on the way.

On the 27th of September 1858 Acting Master Chacken gained the Victoria Cross. Brigadier Douglas, C.B., was keeping up the

communications on the Grand Trunk Road, west of Dinapore. On the 27th of September a small column, under Lieutenant-Colonel Turner, had halted at Khurona for breakfast. Mr. Chicken, who happened to be in the vicinity, on his way to Buxar, attached himself to the cavalry under Lieutenant Baker which moved to attack the enemy in a village near Peeroo. On nearing the enemy Baker at first retired, and clearing the village and jungle, wheeled into line and charged the mutineers, who fled. In the charge Chicken greatly distinguished himself, and in the pursuit, swam his horse through a deep nala, and galloping through Kasauli, dashed into the sugar-cane and the jungle beyond, accompanied by some of the best mounted sowars. He suddenly found himself in the presence of 20 sepoys, and charged them without a moment's hesitation. He killed or wounded five but was dismounted, severely wounded, when four sowars came up and routed the remainder. These sowars received the Order of Merit.

The above is only a selection from the many occasions on which the Indian Navy rendered yeoman service during the Mutiny, but are those most suitable for the purpose of these papers, *e.g.*, the *co-operation* of the Army and Navy.

EXPEDITON AGAINST THE WAGHERS.

The Waghers were a race of pirates inhabiting the Okhamandel Peninsular, on the Katthiawar coast. The Indian Navy had been employed against them in 1820, with a body of troops under Colonel Stanhope, at the storm of Dwarka.

In 1858 the Waghers seized the island of Beyt, and, on the 3rd of April, defeated a force composed of two companies of the 10th Native Infantry and some details of the 16th N. I. and Marine Battation, with a loss of six killed and twenty-six wounded, which, while *en route* from Karachi to Surat, had attempted to carry the fort by escalade. The Waghers evacuated the fort the same night, but, under the impression that Government had their hands full with the Mutiny, reoccupied it and Dwarka the following year, and began to levy toll on the pilgrims who came to worship at the famous shrines. In September the Bombay Government fitted out an expedition, consisting of H. M.'s 28th Regiment, a company of Artillery, a detachment of Sappers, the 6th Native Infantry and 200 men of the Marine Battalion, the whole under Lieutenant-Colonel Donovan, of H. M.'s 33rd Regiment.

The Indian Navy supplied the "Ferooz," "Zenobia," "Berenice," "Victoria," "Clyde," and "Constance"; Commander Cruttenden of the "Ferooz" being senior naval officer. On the 29th of September the squadron sailed, escorting three transports with the troops, and arrived off Beyt, at the entrance to the Gulf, on the 3rd of October. The next day was spent in reconnoitring, while the boats cut out the native craft lying in-shore, and the ships took up a position half a mile south of the fort, whence the castle was bombarded throughout the day. Next morning, after a renewed bombardment, the

order was given to storm, and at 2 P.M. the troops were landed, under a heavy fire from the enemy, protected by the guns of the squadron. The boats, crews, with field-pieces, also landed and covered the advance of the troops. The attempts to escalate met with a heavy fire from the loop-holed curtains and failed. The face of the fort was covered by an entanglement of prickly pear, and it was resolved to withdraw the troops and resume the bombardment. The chief now offered to surrender if the garrison was allowed to march out with its arms, but as unconditional surrender was the order, the flag of truce was hauled down. Soon after dark, however, the Waglers evacuated the fort which was occupied on the following day. It was wonderful that the garrison should have held out for so long, for the "Ferooz" alone fired 1,400 rounds. The walls were from 20 to 40 feet thick and 30 to 40 feet high, and in the unsuccessful assault the attackers lost one officer and 13 men of H. M.'s 28th Regiment, and one officer and 9 men of the 6th N. I. killed, and 2 officers and 33 men of the 25th, 10 of the 6th N. I. and 2 of the Marine Battalion wounded.

The "Zenobia" arrived at Bombay with the wounded on the 11th of October, and returned on the 14th to assist in the reduction of Dwarka, for which a second column of troops, under Colonel Seebie, marched by land. The squadron was reinforced by the "Clive" and proceeded to Dwarka off which the force was assembled.

A correspondent of the *Bombay Gazette* gives the following account of the operations:—

"In order to make Colonel Seebie's force, which was supposed to be about five miles inland, aware of our presence, the 'Ferooz' steamed in abreast of the town, and fired eight shells into it, this being the preconcerted signal, and then anchored to the north-west, nearly opposite to Roopen Bunder, which is $1\frac{1}{2}$ miles north of Dwarka. This is the only place where the troops could effect a landing, on account of the surf which runs all along the coast, with the exception of a few sheltered places. But there is rather an imposing looking fort there, and we noticed horsemen riding between it and the town, evidently making preparations to defend it, so the 'Clive' gun-boat, towing the 'Ferooz', 'Bernice' and 'Zenobia's' first cutters, in charge of Lieutenant Wilson, anchored off it, and commenced firing, which was kept up for some time when the boat's crews rushed up to the fort and took it much to the surprise of everybody as it was expected to have been decided in the usual Wagher style, and the Colonel commanding the head piece stated that he would not have landed there with less than a thousand men, so this was a feather in Jack's cap. On the afternoon of the next day the troops disembarked and in conjunction with Colonel Seebie's forces formed a circle round the land side of the town. I forgot to mention that as soon as the Jacks had taken the fort, Lieutenant Nixon commanding the 'Clive' fired a 24 pounder howitzer, which afterwards harassed the enemy a good deal discharging the gun they brought to the front killing two and wounding a good many. The first thing to be done was to disable the guns, of which they appear to have a good

many, and a 10-inch mortar. The artillery had gradually got their batteries to work, and for the last three days the "Ferooz" and "Zenobia" had been shelling the town. At first the military big-wigs were cautious about going to work, lest they should fire over on the troops on the other side; but, after seeing the practice that was made at Beyt by the ships, they ought to have had more confidence; however they appear to have recovered. The firing from the ships was heavier than the whole of the shore batteries put together. H. M.'s sloop "Clive" arrived on the 25th, when a Naval Brigade was formed, consisting of three Lieutenants—Sedley, commanding, Crockett from the "Ferooz" and Hall from the "Zenobia"—9 midshipmen and 120 blue-jackets. These landed on the 26th, and the next morning at once took up a position above 150 yards from the outer forts and temples, taking possession of a square-looking tower. They were not long left in peace here, for the enemy commenced a heavy fire of musketry, and after a short time brought a gun to bear on them. Before dark they had two officers, Lieutenant Hall and Mr. Midshipman Pulman, and four men wounded. They had brought a 12-pounder field-piece up with them, but it became disabled after a few rounds; so they had no means of silencing the enemy's guns, and there was no cover for them beyond that afforded at the back of the square tower, the single walls of which were too thin to resist round-shot, and there was barely room for 120 men. However, Lieutenant Sedley was determined to hold the position at all hazards, as it was an important one. That night the Waghers made an assault in two parties, one in front and one round by the breach under the high ground on which the town stands. They rushed on, yelling like fiends, but were repulsed with great loss—after killing one seaman and wounding five others. The man who was killed was almost cut in two and otherwise frightfully mangled. The number of the enemy killed is not known, but they were three hours carrying away their wounded. There must already have been a great number killed, as every night large fires were seen burning their dead. Yesterday two more wounded were added to the Naval Brigade casualties, in trying to take possession of an advanced fort. When I say trying, it was taken; and before you could make that popular exclamation 'Jack Robinson,' a midshipman was climbing to the top of the temple and in five minutes more the Union Jack was flying where the Wagher flag had been. The breastworks the enemy had built up were knocked down; the party then retired, as the place was too large, and in too crumbling a state to hold, and there was a heavy fire of musketry on them. The batteries are hard at work as I write and the ships will open fire again in a few minutes. On the evening of the 30th, the Waghers made a sortie on the sailor's battery, but were repulsed with severe loss. Early on Tuesday morning (1st November) they evacuated the fort, cutting their way through the piquets of the 28th Regiment, severely wounding one officer and three men. They passed close to the 28th camp, but the corps could do nothing towards intercepting them, owing to the darkness."

GUN VERSUS HOWITZER, IN THE HEAVY ARTILLERY OF A FIELD ARMY.

**A review of Major K. K. Knapp's "commended" essay in the
Journal of the Royal Artillery Institution.**

BY COLONEL F. G. STONE, *p.s.c.*

Major Knapp has, in the excellent essay under review, brought forward arguments for the abolition of a long range gun in the heavy artillery, and for its replacement by a heavy field howitzer: he regrets the necessity for reopening "the subject of heavy artillery armament, just at the time when the heavy batteries at home are being armed with a heavy gun of the most modern type, but it is unavoidable, since the question now is, *whether guns are any longer a necessary or suitable equipment for heavy artillery.*"

The arguments in support of the contention for a howitzer in lieu of a heavy gun appear so weighty and are so well put, that even a moderately critical reader is almost persuaded to accept them without further examination, and it is to guard against too hasty an acceptance of the views put forward that I propose to discuss, I hope without bias, the validity of the arguments adduced.

Major Knapp's initial argument is that a heavy long range gun was a necessary equipment for heavy artillery, only so long as the field artillery was armed with the 15-pr., but now "the comparatively short ranging 15-pr. has given place to the 18½-pr. quick-firing field gun, which is effective up to 7,500 yards—a range sufficient for all practical purposes in any theatre of war—and consequently much of the work, which has hitherto been assigned to the heavy guns on account of their long ranging powers, will in future be carried out by the field artillery."

The effectiveness of the 18-pr. shrapnel at 7,500 yards is however not to be accepted without comment, and the essayist has somewhat overstated his case. At present there is no fuze in the service which will burst the 18-pr. shrapnel at ranges over 6,200 yards: it is true that there is one now being experimented with, which will burst the shrapnel at ranges up to 7,500 yards, and there is no reason why it should not be successful. But a more serious matter is the fact that elevation cannot be given to the gun for ranges over 6,200 yards, without sinking the trail, and though this procedure might be successfully resorted to occasionally for ranges

even up to 7,000 yards, it is extremely doubtful whether the running out springs would work satisfactorily for continuous and rapid fire at any greater range. At an elevation of over 23 degrees which is required for a range of 7,500 yards, it is more than likely that the gun would be far from effective as a Q-F. gun, even if it could fire continuously at a slower rate. The carriage was constructed to enable the gun to fire as a Q-F. gun at ranges up to 6,200 yards, every 100 yards added to this means additional elevation in a rapidly increasing ratio, and a weight for the running out springs to *lift*, for which they were not designed.

It is obvious that on rocky or frozen ground this device of sinking the trail will not be practicable, at the battle of Mukden for instance, it would have been absolutely impracticable, as a pick could make no impression on the frozen ground.

It will therefore be evident that, as I have said, the essayist has somewhat overstated his case, and it must be acknowledged that the 18-pr. could not on all occasions do the work of the 60-pr. at ranges between 6,200 yards and 7,500 yards, and therefore that the 60-pr. cannot be lightly dismissed even on the unproved assumption that 7,500 yards is a range sufficient for all practical purposes.

Let us now examine the essayist's argument, apart from the difficulties mentioned above with reference to sinking the trail, and consider the following questions without prejudice.

(1) Is the 18-pr. shrapnel as effective as the 60-pr. shrapnel at 7,500 yards or at ranges approximating thereto?

(2) Is it necessary to consider ranges over 7,500 yards at all?

As regards (1)

Let us consider the principal uses of long range shrapnel from guns; some of the most important are—*In the attack*

- (a) for enfilading the enemy's artillery positions or infantry trenches,
- (b) for attacking the enemy's supports or reserves, or other bodies of troops manœuvring in rear of the line of resistance, for "searching" for "cutting off" the point of attack by means of cross fire.

In the pursuit for attacking the enemy's main body, over the head of his retreat guard.

In the defence for causing the attacker to deploy at the maximum distance, and for compelling turning movements to be executed on a wide arc.

Now for all these purposes the effect of the shrapnel will be directly proportional to the flatness of the trajectory, and to the remaining velocity at the time of bursting, in fact the depth of the zone covered by effective shrapnel bursts will be a direct measure of the value of the fire.

The following table shows at a glance how the 18-pr. shrapnel compared with the 60-pr. shrapnel in these particulars, which immediately affect the depth of the zone of effective shrapnel as well

as the time of flight and accuracy of shooting at the maximum range for the 18-pr., *viz.*, 7,500 yards.

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The really important differences are in the angle of descent, which in the case of the 18-pr. is practically double that of the 60-pr.; and in the remaining velocity, which in the case of the 18-pr. is more than 200 f.s. less than that of the 60-pr.

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We have no experimental data to go on, and it is not possible to calculate, with absolute precision, how much further the 60-pr. shrapnel bullet would range effectively after the burst of the shell than that of the 18-pr.; but it appears quite a moderate estimate to say that at 7,500 yards' range, the depth of zone covered by effective shrapnel bullets, will be twice as great in the case of the 60-pr. as in the case of the 18-pr.; the actual number of bullets which fall in this zone is dealt with later, it does not affect the question now under discussion.

If we compare the range tables of the two guns at shorter ranges, we shall find that, in respect to angle of descent, that of the 60-pr. shrapnel is roughly half as steep as that of the 18-pr. all through; and the difference in remaining velocity is greater in comparison, as the range gets shorter.

It is interesting to note that whereas the limit of the 18-pr. shrapnel is reached at 7,500 yards, because, beyond that range, the bullets would not have effective striking energy at 200 yards from the point of burst; the limit of the 60-pr. shrapnel, on the other hand, is fixed at 9,560 yards, simply because it was considered impracticable to employ shrapnel fire usefully beyond that range; the following table shows that there is no question of the shrapnel becoming ineffective owing to insufficient striking energy, and that even up to 10,400 yards, the accuracy is not gravely affected, while the angle of descent is still less than that of the 18-pr. at 7,500 yards.

Range 60-pr. B. L.	Angle of descent.	Remaining velocity, f. s.	50 % OF ROUNDS FALL IN.	
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It has been clearly demonstrated that the 18-pr. shrapnel is *not* as effective as the 60-pr. shrapnel at 7,500 yards, or at ranges approximating thereto, or in fact at any ranges, in respect to depth of zone covered by effective shrapnel.

We now have to consider (2) Is it necessary to consider ranges over 7,500 yards at all? Major Knapp thinks 7,500 yards "sufficient for all practical purposes in any theatre of war," owing to the difficulty of observation at "longer ranges."

It is however at ranges over 7,500 yards that heavy artillery expects to achieve its most important results: it will be readily admitted that enfilade fire is at once the most deadly and at the same time the most difficult nature of fire to obtain, owing usually to the impossibility of taking an enfilading position without coming so close to another portion of the enemy's line that the enfilading batteries are certain to be wiped out before they can establish an effective fire. But the long range of the 60-pr. enables a heavy battery to take a position for enfilade fire, so much further from the enemy's line, while still in prolongation of the line to be enfiladed, that what would be out of the question for a field battery is perfectly practicable for a heavy battery.

Many instances could be quoted from the Russo-Japanese War, in which long range shrapnel fire of heavy guns for enfilading the Russian artillery positions, when they could not be reached effectively in any other way, would have been invaluable. The two most notable of these were:—

(1) The attack by the Japanese II Army on the redoubtable Shou-shan-po position, before Liao-yang: in this case the Russian batteries were so admirably placed that nothing could touch them, and the Japanese were utterly unable to carry the position, until a successful night attack brought the 48 hours' fighting to a close just as the Russian Commander-in-Chief had issued orders to retire. Practicably the only vulnerable point in the position was the prolongation of the Russian right flank towards Wang-erh-tung; a heavy battery placed near this point could have enfiladed the whole line, at ranges of from 7,000 to 9,000 yards; closer ranges were impossible to obtain owing to the commanding hill on the Russian right flank which dominated the entire plain and was situated at a distance of 6,000 yards from Wang-erh-tung: this hill, though prohibiting a nearer approach to the Russian position, was altogether separate from the group of hills on which the main Russian artillery position was so cleverly concealed from the front, and was separated

therefrom by a plain 500 yards in width; the commanding hill, being in echelon to the rear of the prolongation of the artillery position, allowed a clear view to be obtained from the neighbourhood of Wang-erh-tung across the plain along the rear of the group of hills occupied by the artillery. There was however no heavy artillery available.

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But the 60-pr. does not come into competition with the 18-pr. here, this rôle is essentially that of a Q.-F. gun: it may, under special circumstances, be necessary to supplement the fire of the field artillery—as Field Artillery Training, p. 222, says:—"Occasions may well arise, when to gain decisive results, it will be necessary to mass heavy guns in line with those of lighter calibres:" this will usually be the case at long ranges. It is well to note, in connection with the argument that three 18-pr. shrapnel are more effective (10 per cent more bullets?) than one 60-pr. shrapnel—that the total number of rounds per gun, carried for the 18-pr. (508) in front of the advanced *dépôt*, is considerably less than three times the total number of rounds carried for the 60-pr. (250) and slightly less than three times the number of shrapnel (175). It is however true that three 18-pr. shell weigh less than one 60-pr. shell.

The essayist very truly remarks that "judging from the Russo-Japanese War, it is vain to think that hostile guns can be silenced by the destruction of material": this remark is equally as true now as it was in 1870, and really emphasises the necessity for a long range shrapnel gun, which will be able to take the enemy's artillery positions in enfilade or even in reverse. (See examples given above—Shou-shan-pu and Ta-shi-chiao.) The plea for a heavier howitzer equipment as a "means of attacking the personnel of batteries behind their gun shields" does not seem to have any particular weight, since this rôle can be performed equally well by the field artillery howitzer (*i.e.*, the new one), especially when in combination with heavy gun enfilade fire.

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Although the heavy howitzers would not be of any particular value in this case as compared with the field howitzers, the heavy *guns*, on the other hand, would be invaluable; their enfilade or cross fire would produce results quite beyond the power of any howitzer to produce: anyone who has been close to the targets on the practice range cannot fail to have been struck with the difference between the gentle patter of the howitzer shrapnel bullets and the

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Major Knapp first considers “woods” under the head of “localities.” I agree with him in thinking that the lyddite shell of the 60-pr. would not be very effective; but on the other hand I cannot go the length of agreeing with him in thinking that “the moral effect of the powerful high explosive (heavy howitzer) shell, dropping into and bursting inside the wood, could not fail to be terrifying to the occupants.” In the first place the attack on the wood would be rather in the nature of a general bombardment, “firing into the brown” so to speak; and in the second place, I can imagine the occupants of the wood regarding the local effect of these shell with considerable equanimity, especially if they had the sense to select soft ground for their cover.

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During the battle of the Sha-ho, the Japanese attack on the village of La-mu-tun affords a good instance of what might have been effected by heavy guns, if they had been available: the prevailing flatness of the country, studded with villages, offered no well defined positions for defence, and rendered the effective employment of field artillery by the attack, most difficult: La-mu-tun and its approaches were swept by Russian artillery fire, and though the

Japanese, with desperate bravery, succeeded in carrying the village after losing heavily, they were unable to issue from it or hold it, and the Russian counter-attack speedily drove them out again: the battle swayed backwards and forwards at this point for several hours; but if the Japanese had been in possession of a heavy battery, and brought it into action on the high ground between Chang-yu-tun and San-chia-tsz at a range of 8,800 yards from Russian batteries, it would have at once dominated the situation, kept the fire of the Russian batteries in check and swept the whole field between their artillery position and La-mu-tun at ranges from 8,800 yards to 5,000 yards and absolutely prohibited any counter-attack. It will be observed that the attack of a village, which is apt to be treated as an isolated operation, in discussing the most suitable kind of artillery for the purpose, is on the contrary a problem which usually has to be considered in connection with a larger tactical operation: if, in the instance just given, the Japanese had been offered a choice between a battery of 60-pr. guns ranging with shrapnel up to 9,500 yards and with lyddite to 10,400 yards, and a heavy howitzer battery ranging up to 7,500 yards, with its necessarily less effective shrapnel, there would have been no two opinions as to which they would have preferred.

There is another point which deserves notice when comparing the effectiveness of howitzer and gunfire, *viz.*, the time of flight: at long ranges, the time of flight of the howitzer shell will be about three times as long as that of the 60-pr. gun shell; this is a factor which cannot be safely ignored in field operations: to put it plainly, a 60-pr. gun battery will get its first effective time shrapnel while the howitzer battery is still engaged in ranging.

From this point Major Knapp proceeds to explain why a heavy howitzer is required in addition to a field artillery howitzer, and why the heavy howitzer should be included in the heavy artillery establishments of the field army. He says:—"the fire of Q.-F. guns compels an extensive use of cover, which, in its turn, necessitates a greater use of howitzer fire. Up to a certain point, field howitzer will be sufficiently powerful and more suitable than the heavier weapons: but the employment of field howitzer reacts in its turn, and necessitates the use of strong head cover. This leads to a general improvement in the construction of field fortifications, and so increases the value of heavy howitzers." No one can fail to agree with this, but is it a valid argument for replacing the guns of our heavy batteries in the field army by howitzers? It appears that the occasions on which field fortification of the type suggested is encountered, such as was actually the case at Liao-yang and Mukden, are the very occasions provided for on page 2 of Garrison Artillery Training, 1906, Vol. II:—"Medium siege brigades will be horsed and organised as mobile units: it is intended that in addition to being available for use in a siege, they should be utilised, if required, for work in the field." My argument is *not* that a heavy howitzer is of no use, but that since its useful employment in preference to the

field artillery howitzer is confined to the destruction of field fortification, its rôle is of an occasional or special nature and not normal to the requirements of a field army; this being so, that heavy howitzer batteries should not be incorporated in field army establishments as integral parts of field army formations, but should maintain the separate organisation which is provided for them as siege units, and that, as such, every effort should be made to render that organisation a practical working reality in our combined peace training—in fact that the medium siege brigades should be regularly brought into contact with the field army for occasional combined operations, although not normally incorporated in the establishments of the field army as component units thereof.

It is necessary to keep very clearly in mind what is feasible for a field army, as such, to carry out; and it may be accepted that the *destruction* of earthworks, entrenchments, and *strongly* fortified villages, is not practicable for the artillery of the field army, whose rôle in this connection must be confined to making such works or defences *temporarily untenable* or, at all events, *useless for offence*, at critical phases of the attack: if these defences are of such a formidable nature as to require actual demolition, this must partake of the nature of a siege operation, and suitable siege ordnance brought on to the scene to co-operate with the heavy artillery of the field army.

Major Knapp quotes the action of some of the leading military powers in support of his contention for howitzer instead of guns, in the heavy artillery of the field army, but it is not quite clear why we should take these authorities unquestionably as our guides in this matter. The primary object of the heavy artillery of a continental power is—to quote the German Regulation—"to pave the way for the infantry attack against strongly fortified positions and forts d'arrêt; but whilst the sphere of mortar battalions is, in this respect, a limited one, the action of howitzer battalions more closely resembles that of other arms on the battlefield and they will be found a valuable support to the field artillery engaged with the hostile artillery." In other words, the field armies have to get through the line of barrier forts which jealously guard continental frontiers, with the least possible delay, in order to operate in their enemy's territory, and therefore, what we might term medium siege brigades, are in the German army *attached* to each Army Corps: I say "*attached*" advisedly, as they will be distributed on mobilisation as required, and will not in war, necessarily accompany the Army Corps to which they are attached in peace. Germany is the only continental power which can be said to have organised heavy artillery on a permanent basis; the German heavy artillery is armed with howitzers on travelling carriages and mortars fired from platforms or beds.

The French have made a serious start with their Rimailho howitzer, and in a couple of years perhaps will have a complete permanent organisation.

The Japanese, who are not under the same restrictions as continental powers, have just made a beginning with "heavy field

GUN VERSUS HOWITZER, IN THE HEAVY ARTILLERY OF A FIELD ARMY.

**A review of Major K. K. Knapp's "commended" essay in the
Journal of the Royal Artillery Institution.**

BY COLONEL F. G. STONE, *p.s.c.*

Major Knapp has, in the excellent essay under review, brought forward arguments for the abolition of a long range gun in the heavy artillery, and for its replacement by a heavy field howitzer: he regrets the necessity for reopening "the subject of heavy artillery armament, just at the time when the heavy batteries at home are being armed with a heavy gun of the most modern type, but it is unavoidable, since the question now is, *whether guns are any longer a necessary or suitable equipment for heavy artillery.*"

The arguments in support of the contention for a howitzer in lieu of a heavy gun appear so weighty and are so well put, that even a moderately critical reader is almost persuaded to accept them without further examination, and it is to guard against too hasty an acceptance of the views put forward that I propose to discuss, I hope without bias, the validity of the arguments adduced.

Major Knapp's initial argument is that a heavy long range gun was a necessary equipment for heavy artillery, only so long as the field artillery was armed with the 15-pr., but now "the comparatively short ranging 15-pr. has given place to the 18½-pr. quick-firing field gun, which is effective up to 7,500 yards—a range sufficient for all practical purposes in any theatre of war—and consequently much of the work, which has hitherto been assigned to the heavy guns on account of their long ranging powers, will in future be carried out by the field artillery."

The effectiveness of the 18-pr. shrapnel at 7,500 yards is however not to be accepted without comment, and the essayist has somewhat overstated his case. At present there is no fuze in the service which will burst the 18-pr. shrapnel at ranges over 6,200 yards: it is true that there is one now being experimented with, which will burst the shrapnel at ranges up to 7,500 yards, and there is no reason why it should not be successful. But a more serious matter is the fact that elevation cannot be given to the gun for ranges over 6,200 yards, without sinking the trail, and though this procedure might be successfully resorted to occasionally for ranges

even up to 7,000 yards, it is extremely doubtful whether the running out springs would work satisfactorily for continuous and rapid fire at any greater range. At an elevation of over 23 degrees which is required for a range of 7,500 yards, it is more than likely that the gun would be far from effective as a Q. F. gun, even if it could fire continuously at a slower rate. The carriage was constructed to enable the gun to fire as a Q. F. gun at ranges up to 6,200 yards, every 100 yards added to this means additional elevation in a rapidly increasing ratio, and a weight for the running out springs to *lift*, for which they were not designed.

It is obvious that on rocky or frozen ground this device of sinking the trail will not be practicable, at the battle of Mukden for instance, it would have been absolutely impracticable, as a pick could make no impression on the frozen ground.

It will therefore be evident that, as I have said, the essayist has somewhat overstated his case, and it must be acknowledged that the 18 pr. could not on all occasions do the work of the 60 pr. at ranges between 6,200 yards and 7,500 yards, and therefore that the 60 pr. cannot be lightly dismissed even on the unproved assumption that 7,500 yards is a range sufficient for all practical purposes.

Let us now examine the essayist's argument, apart from the difficulties mentioned above with reference to sinking the trail, and consider the following questions without prejudice.

(1) Is the 18 pr. shrapnel as effective as the 60 pr. shrapnel at 7,500 yards or at ranges approximating thereto?

(2) Is it necessary to consider ranges over 7,500 yards at all?

As regards (1).

Let us consider the principal uses of long range shrapnel from guns: some of the most important are—*In the attack*

(a) for enfilading the enemy's artillery positions or infantry trenches;

(b) for attacking the enemy's supports or reserves or other bodies of troops manœuvring in rear of the line of resistance; for searching for, and cutting off the point of attack, by means of cross fire.

In the pursuit for attacking the enemy's main body, over the head of his rearguard.

In the defence for causing the attacker to deploy at the maximum distance, and for compelling turning movements to be executed on a wide arc.

Now for all these purposes the effect of the shrapnel will be directly proportional to the flatness of the trajectory, and to the remaining velocity at the time of bursting, and to the depth of the zone covered by effective shrapnel bursts will be a direct measure of the value of the fire.

The following table shows at a glance how the 18 pr. shrapnel compared with the 60 pr. shrapnel in these particulars, which immediately affords the depth of the zone of effective shrapnel as well

as the time of flight and accuracy of shooting at the maximum range for the 18-pr., *viz.*, 7,500 yards.

Nature of gun.	Angle of descent.	Remaining velocity, f.s.	Time of flight, secs.	50% OF ROUNDS FALL IN.	
				Length, yards.	Breadth, yards.
60-pr.	18°50'	913	18.90	75.6	9.5
18-pr.	36°3'	704	27.74	77.0	7.5

The question of comparative accuracy may at once be dismissed, the difference between the shooting of the two guns in this respect being inappreciable, and almost literally "as broad as it is long."

The difference in the time of flight also is not a matter of great importance, but such as it is, it is in favour of the 60-pr.

The really important differences are in the angle of descent, which in the case of the 18-pr. is practically double that of the 60-pr.; and in the remaining velocity, which in the case of the 18-pr. is more than 200 f.s. less than that of the 60-pr.

In addition to the remaining velocity of the shell, we must consider that the bullets of the 60-pr. are 35 to the pound, against 41 to the pound in the case of the 18-pr.; this factor gives a sufficient "striking energy" at an appreciably longer distance from the point of burst.

We have no experimental data to go on, and it is not possible to calculate, with absolute precision, how much further the 60-pr. shrapnel bullet would range effectively after the burst of the shell than that of the 18-pr.; but it appears quite a moderate estimate to say that at 7,500 yards' range, the depth of zone covered by effective shrapnel bullets, will be twice as great in the case of the 60-pr. as in the case of the 18-pr.; the actual number of bullets which fall in this zone is dealt with later, it does not affect the question now under discussion.

If we compare the range tables of the two guns at shorter ranges, we shall find that, in respect to angle of descent, that of the 60-pr. shrapnel is roughly half as steep as that of the 18-pr. all through; and the difference in remaining velocity is greater in comparison, as the range gets shorter.

It is interesting to note that whereas the limit of the 18-pr. shrapnel is reached at 7,500 yards, because, beyond that range, the bullets would not have effective striking energy at 200 yards from the point of burst: the limit of the 60-pr. shrapnel, on the other hand, is fixed at 9,500 yards, simply because it was considered impracticable to employ shrapnel fire usefully beyond that range: the following table shows that there is no question of the shrapnel becoming ineffective owing to insufficient striking energy, and that even up to 10,400 yards, the accuracy is not gravely affected, while the angle of descent is still less than that of the 18-pr. at 7,500 yards.

Range 60-pr. R. L.	Angle of descent	Remaining velocity, f.t.s.	DISTANCE OF ROUNDS FALL IN	
			Length, yards	Breadth, yards
7,500	18° 50	913	75.6	9.5
9,500	28° 50	809	81.1	14.2
10,000	32° 45	804	93.8	16.1

It has been clearly demonstrated that the 18 pr. shrapnel is *not* as effective as the 60-pr. shrapnel at 7,500 yards, or at ranges approximating thereto, or in fact at any ranges, in respect to depth of zone covered by effective shrapnel.

We now have to consider 2) Is it necessary to consider ranges over 7,500 yards at all? Major Knapp thinks 7,500 yards "sufficient for all practical purposes in any theatre of war," owing to the difficulty of observation at "longer ranges."

It is however at ranges over 7,500 yards that heavy artillery expects to achieve its most important results: it will be readily admitted that enfilade fire is at once the most deadly and at the same time the most difficult nature of fire to obtain, owing usually to the impossibility of taking an enfilading position without coming so close to another portion of the enemy's line that the enfilading batteries are certain to be wiped out before they can establish an effective fire. But the long range of the 60 pr. enables a heavy battery to take a position for enfilade fire so much further from the enemy's line while still in prolongation of the line to be enfiladed, that what would be out of the question for a field battery is perfectly practicable for a heavy battery.

Many instances could be quoted from the Russo-Japanese War, in which long range shrapnel fire of heavy guns for enfilading the Russian artillery positions, when they could not be reached effectively in any other way, would have been invaluable. The two most notable of these were:

1) The attack by the Japanese II Army on the redoubtable Shou-shan position before Liao-yang. In this case the Russian batteries were so vulnerably placed that nothing could touch them, and the Japanese were utterly unable to carry the position until a successful night attack brought the 48 hours' fighting to a close just as the Russian Commander in Chief had issued orders to retire. Practically the only vulnerable point in the position was the prolongation of the Russian right flank towards Wang-chi-tung; a heavy battery placed near this point could have enfiladed the whole line at ranges of from 7,000 to 9,000 yards; closer ranges were impossible to obtain owing to the commanding hill on the Russian right flank which dominated the entire plain and was situated at a distance of 6,000 yards from Wang-chi-tung; this hill though prohibiting a nearer approach to the Russian position was a single separate from the group of hills on which the main Russian artillery position was so cleverly concealed from the front, and was separated

therefrom by a plain 500 yards in width; the commanding hill, being in echelon to the rear of the prolongation of the artillery position, allowed a clear view to be obtained from the neighbourhood of Wang-erh-tung across the plain along the rear of the group of hills occupied by the artillery. There was however no heavy artillery available.

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It seems also questionable whether “against buildings and villages, heavy howitzers” (*i.e.*, howitzers suitable for the heavy artillery of the field army) “with their powerful shell, and the steep angle of descent of these projectiles, will produce greater destructive effect than heavy guns.” Probably within the limits of the howitzer’s range, either gun or howitzer would be equally effective with lyddite shell, but at longer ranges, *i.e.*, outside howitzer range, and where enfilade fire is required, the advantage of the heavy gun will at once be apparent. During the Russo-Japanese War, there were many instances in the battle of the Sha-ho and in the battle of Mukden of determined village defence; in the latter battle, villages were converted into forts mutually supporting each other, and were in some cases so formidable that siege ordnance and siege operations were requisite for their capture, *e.g.*, Kan-kuan-tun and Yang-shi-tun, south of Mukden, which successfully resisted the determined attacks of the Japanese 8th Division for four days, and were not even then captured by assault: in such a case, the heavy artillery of a field army, whether armed with howitzers or guns, is scarcely suitable for coping with the situation unaided; it is an occasion for medium siege artillery mobile brigades.

During the battle of the Sha-ho, the Japanese attack on the village of La-mu-tun affords a good instance of what might have been effected by heavy guns, if they had been available: the prevailing flatness of the country, studded with villages, offered no well defined positions for defence, and rendered the effective employment of field artillery by the attack, most difficult: La-mu-tun and its approaches were swept by Russian artillery fire, and though the

Japanese, with desperate bravery, succeeded in carrying the village after losing heavily, they were unable to issue from it or hold it, and the Russian counter-attack speedily drove them out again—the battle swayed backwards and forwards at this point for several hours, but if the Japanese had been in possession of a heavy battery, and brought it into action on the high ground between Chang yu-tun and San-chia-tsz at a range of 8,800 yards from Russian batteries, it would have at once dominated the situation, kept the fire of the Russian batteries in check and swept the whole field between their artillery position and Lu-mu-tun at ranges from 8,800 yards to 5,000 yards and absolutely prohibited any counter-attack. It will be observed that the attack of a village, which is apt to be treated as an isolated operation, in discussing the most suitable kind of artillery for the purpose, is on the contrary a problem which usually has to be considered in connection with a larger tactical operation. If in the instance just given, the Japanese had been offered a choice between a battery of 60-pr. guns ranging with shrapnel up to 9,500 yards and with lyddite to 10,400 yards, and a heavy howitzer battery ranging up to 7,500 yards, with its necessarily less effective shrapnel, there would have been no two opinions as to which they would have preferred.

There is another point which deserves notice when comparing the effectiveness of howitzer and gunfire, *viz.*, the time of flight. At long ranges the time of flight of the howitzer shell will be about three times as long as that of the 60-pr. gun shell; this is a factor which cannot be safely ignored in field operations. To put it plainly, a 60-pr. gun battery will get its first effective time shrapnel while the howitzer battery is still engaged in ranging.

From this point Major Knapp proceeds to explain why a heavy howitzer is required in addition to a field artillery howitzer, and why the heavy howitzer should be included in the heavy artillery establishments of the field army. He says: "If the fire of Q. F. guns compels an extensive use of cover which, in its turn, necessitates a greater use of howitzer fire. Up to a certain point the field howitzer will be sufficiently powerful and more suitable than the heavier weapons, but the employment of field howitzer reacts in its turn, and necessitates the use of strong head cover. This leads to a general improvement in the construction of field fortifications, and so increases the value of heavy howitzers. No one can fail to agree with this, but is it a valid argument for replacing the guns of our heavy batteries in the field army by howitzers? It appears that the occasions on which field fortifications of the type suggested are encountered, such as was notably the case at Lo-yang and Mukden, are the very occasions provided for on page 2 of *Course in Artillery Training 1906* Vol. II—'Medium siege batteries which are based and organised as mobile units, it is intended that in addition to being available for use in sieges, they should be utilised in support of work in the field.' My argument is not that a heavy howitzer is of no use, but that since its usefulness is greatly in preference to the

field artillery howitzer is confined to the destruction of field fortification, its rôle is of an occasional or special nature and not normal to the requirements of a field army; this being so, that heavy howitzer batteries should not be incorporated in field army establishments as integral parts of field army formations, but should maintain the separate organisation which is provided for them as siege units, and that, as such, every effort should be made to render that organisation a practical working reality in our combined peace training—in fact that the medium siege brigades should be regularly brought into contact with the field army for occasional combined operations, although not normally incorporated in the establishments of the field army as component units thereof.

It is necessary to keep very clearly in mind what is feasible for a field army, as such, to carry out; and it may be accepted that the *destruction* of earthworks, entrenchments, and *strongly* fortified villages, is not practicable for the artillery of the field army, whose rôle in this connection must be confined to making such works or defences *temporarily untenable* or, at all events, *useless for offence*, at critical phases of the attack: if these defences are of such a formidable nature as to require actual demolition, this must partake of the nature of a siege operation, and suitable siege ordnance brought on to the scene to co-operate with the heavy artillery of the field army.

Major Knapp quotes the action of some of the leading military powers in support of his contention for howitzer instead of guns, in the heavy artillery of the field army, but it is not quite clear why we should take these authorities unquestionably as our guides in this matter. The primary object of the heavy artillery of a continental power is—to quote the German Regulation—“to pave the way for the infantry attack against strongly fortified positions and forts d'arrêt; but whilst the sphere of mortar battalions is, in this respect, a limited one, the action of howitzer battalions more closely resembles that of other arms on the battle-field and they will be found a valuable support to the field artillery engaged with the hostile artillery.” In other words, the field armies have to get through the line of barrier forts which jealously guard continental frontiers, with the least possible delay, in order to operate in their enemy's territory, and therefore, what we might term medium siege brigades, are in the German army *attached* to each Army Corps: I say “attached” advisedly, as they will be distributed on mobilisation as required, and will not in war, necessarily accompany the Army Corps to which they are attached in peace. Germany is the only continental power which can be said to have organised heavy artillery on a permanent basis: the German heavy artillery is armed with howitzers on travelling carriages and mortars fired from platforms or beds.

The French have made a serious start with their Rimailho howitzer, and in a couple of years perhaps will have a complete permanent organisation.

The Japanese, who are not under the same restrictions as continental powers, have just made a beginning with “heavy field

artillery"; so far, the armament is confined to howitzers: it seems possible that the difficulty, which they would have in horsing heavy guns, may account for the fact that they seem to have limited their views to howitzers: for, as Major Knapp correctly points out "in the matter of mobility, howitzers are more suitable, as heavy artillery weapons, than guns: for it is possible to manufacture a howitzer equipment of much less weight than a gun equipment, which fires an equally heavy shell" (but has a shorter range) "and so greater mobility can be obtained without any sacrifice of shell power" (this is not correct as regards *effectiveness* of shrapnel). This argument may possibly apply to cases in which suitable draught power for heavy guns cannot be provided, but howitzers can never take the place of heavy guns under conditions which call for effective shrapnel fire at ranges outside the effective limit of field guns (this does not refer to searching behind cover, which is necessarily the role of howitzers); the rôle of the heavy howitzers will be primarily the destruction of material which is beyond the power of the field artillery howitzer to cope with, and, secondarily, to "furnish a valuable support to the field artillery engaged with the hostile artillery." But is it worth while for these objects to include howitzer batteries in the heavy artillery of a field army formation, instead of attaching them as required from medium siege brigades—the latter being organised and trained accordingly, with this object in view?

And here it should be noted that Major Knapp actually contemplates an organisation for the heavy howitzer batteries which corresponds more nearly with that of the medium siege brigades than with that of the heavy artillery which now forms an integral part of every Division. He says:—"But when the heavy artillery is armed with a modern heavy howitzer capable of fulfilling the purpose for which it is now required, *i.e.* preparing the way for the infantry attack on fortified positions, it will be essential, for the proper performance of this work, that the batteries be brigaded together, once more in the corps artillery". In this I fully agree, but would go a step further, and call them "medium siege brigades"—to be attached to army troops as required and train them in the siege artillery school instead of in the field artillery school—but attach them to the field army from time to time for combined operations.

We must now pass on to the question of heavy artillery for India. Major Knapp says of the 60 pr.—"This equipment would be utterly unserviceable for employment across the frontier of India on account of its excessive weight which would soon reduce the batteries to a state of immobility."

This is indeed serious, and requires most careful consideration; it must be remembered however that Major Knapp is opposed to the heavy guns for quite other reasons, and would not have them at any price, no matter how noble they might be, as he maintains that their functions can be better performed by field guns and heavy howitzers. This being the case it seems desirable for those who believe in the tactical rôle of the 60 pr. batteries to ask if the

possibility of using this gun in heavy batteries, across the Indian frontier, has been exhaustively discussed, and what data of an experimental nature exist, upon which to found the dictum that "they would be utterly unserviceable." It must be borne in mind that Major Knapp is not content with the "walk" as the normal pace of heavy artillery; he says:—"Heavy artillery equipments should be sufficiently mobile to allow of batteries moving several miles at a trot in case of emergency": under such conditions it is easy to conceive that the 60-pr. equipments, if employed across the frontier of India, would, indeed, speedily become "utterly unserviceable."

The experience of the South African War, and, I might add, of the Afghan War, shows that our Generals have never hesitated to place heavy batteries well to the front on the line of march when occasion requires it: in Southern Afghanistan, a heavy battery was the first battery of the main body to enter the Bolan Pass: in South Africa the heavy artillery was close to the head of the column at Botha's Pass, and at Gansvlei the 4·7 guns were in action before any of the field batteries, again at Alleman's Nek the heavy artillery was well to the front. It is thus by judiciously arranging the column of route, and not by "moving several miles at a trot," that the requirements of any situation can best be met by the heavy artillery. Colonel May in his "Retrospect of the South African War" treats this part of the question fully and conclusively, and Major Jeudwine in his Gold Medal Prize essay is equally clear as to the position on the line of march.

It is to be feared that the evolution of Major Knapp's ideal would bring the heavy artillery perilously near the reproach of being "bad field artillery"—a consummation which I feel sure he would be the first to deprecate. Coming into action at a trot, *when under fire or in an open position*, is another matter altogether; it will not hurt the horses to trot a hundred yards just before they are going to have a long rest, while the battery is in action, neither will it unsteady the gunners even if they are not mounted as Major Knapp proposes: but the trot should be strictly limited to the occasions when the situation requires it, as defined by italics.

Walers have been found satisfactory for the existing heavy batteries in India, and it may be observed that their limit of useful draught has not been exhausted; teams of 12 horses were successfully employed in South Africa, and experience has shown that the efficiency of any team can be increased 33 per cent if "relief" horses are provided at the same rate; in fact, it will pay better as a rule with 12 horses, to put only 8 in the team at one time, and employ reliefs of 4, so that each horse will only be in draught for two-thirds of the whole time occupied in making a march; the whole of the horses can always be put in draught to get the guns over temporary difficulties. It goes without saying that long teams require the best driving, and it is essential that the No. 1 should be mounted in order to supervise the driving, if for no other reason. (There are, of course, other and weighty reasons.)

even up to 7,000 yards, it is extremely doubtful whether the running out springs would work satisfactorily for continuous and rapid fire at any greater range. At an elevation of over 23 degrees which is required for a range of 7,500 yards, it is more than likely that the gun would be far from effective as a Q. F. gun, even if it could fire continuously at a slower rate. The carriage was constructed to enable the gun to fire as a Q. F. gun at ranges up to 6,200 yards, every 100 yards added to this means additional elevation in a rapidly increasing ratio, and a weight for the running out springs to *lift*, for which they were not designed.

It is obvious that on rocky or frozen ground this device of sinking the trail will not be practicable, at the battle of Mukden for instance, it would have been absolutely impracticable, as a pick could make no impression on the frozen ground.

It will therefore be evident that, as I have said, the essayist has somewhat overstated his case, and it must be acknowledged that the 18 pr. could not on all occasions do the work of the 60 pr. at ranges between 6,200 yards and 7,500 yards, and therefore that the 60-pr. cannot be lightly dismissed even on the unproved assumption that 7,500 yards is a range sufficient for all practical purposes.

Let us now examine the essayist's argument apart from the difficulties mentioned above with reference to sinking the trail, and consider the following questions without prejudice.

(1) Is the 18 pr. shrapnel as effective as the 60 pr. shrapnel at 7,500 yards or at ranges approximating thereto?

(2) Is it necessary to consider ranges over 7,500 yards at all?

As regards (1)

Let us consider the principal uses of long range shrapnel from guns. Some of the most important are—*In the attack*

- (a) for enfilading the enemy's artillery positions or infantry trenches;
- (b) for attacking the enemy's supports or reserves, or other bodies of troops manœuvring in rear of the line of resistance; for searching for, and cutting off the point of attack, by means of cross fire.

In the pursuit for attacking the enemy's main body, over the head of his rear guard.

In the defence for causing the attacker to deploy at the maximum distance, and for compelling turning movements to be executed on a wide arc.

Now for all these purposes the effect of the shrapnel will be directly proportional to the flatness of the trajectory, and to the remaining velocity at the time of bursting, and to the depth of the zone covered by effective shrapnel bursts will be a direct measure of the value of the fire.

The following table shows at a glance how the 18 pr. shrapnel compares with the 60-pr. shrapnel in these particulars, which immediately affect the depth of the zone of effective shrapnel as well

as the time of flight and accuracy of shooting at the maximum range for the 18-pr., *viz.*, 7,500 yards.

Nature of gun.	Angle of descent.	Remaining velocity, f.s.	Time of flight, secs.	50 % OF ROUNDS FALL IN.	
				Length, yards.	Breadth, yards.
60-pr.	18° 50'	913	18.90	75.6	9.5
18-pr.	36° 3'	704	27.74	77.0	7.5

The question of comparative accuracy may at once be dismissed, the difference between the shooting of the two guns in this respect being inappreciable, and almost literally "as broad as it is long."

The difference in the time of flight also is not a matter of great importance, but such as it is, it is in favour of the 60-pr.

The really important differences are in the angle of descent, which in the case of the 18-pr. is practically double that of the 60-pr.; and in the remaining velocity, which in the case of the 18-pr. is more than 200 f.s. less than that of the 60-pr.

In addition to the remaining velocity of the shell, we must consider that the bullets of the 60-pr. are 35 to the pound, against 41 to the pound in the case of the 18-pr.; this factor gives a sufficient "striking energy" at an appreciably longer distance from the point of burst.

We have no experimental data to go on, and it is not possible to calculate, with absolute precision, how much further the 60-pr. shrapnel bullet would range effectively after the burst of the shell than that of the 18-pr.; but it appears quite a moderate estimate to say that at 7,500 yards' range, the depth of zone covered by effective shrapnel bullets, will be twice as great in the case of the 60-pr. as in the case of the 18-pr.; the actual number of bullets which fall in this zone is dealt with later, it does not affect the question now under discussion.

If we compare the range tables of the two guns at shorter ranges, we shall find that, in respect to angle of descent, that of the 60-pr. shrapnel is roughly half as steep as that of the 18-pr. all through; and the difference in remaining velocity is greater in comparison, as the range gets shorter.

It is interesting to note that whereas the limit of the 18-pr. shrapnel is reached at 7,500 yards, because, beyond that range, the bullets would not have effective striking energy at 200 yards from the point of burst: the limit of the 60-pr. shrapnel, on the other hand, is fixed at 9,560 yards, simply because it was considered impracticable to employ shrapnel fire usefully beyond that range: the following table shows that there is no question of the shrapnel becoming ineffective owing to insufficient striking energy, and that even up to 10,400 yards, the accuracy is not gravely affected, while the angle of descent is still less than that of the 18-pr. at 7,500 yards.

Range, 60-pr. B. L.	Angle of descent.	Remaining velocity, f. s.	20% OF ROUNDS FALL IN	
			Length, yards	Breadth, yards
7,500	18.50	913	75.6	9.5
9,500	28.80	809	81.3	14.2
10,000	32.35	804	93.8	16.1

It has been clearly demonstrated that the 18-pr. shrapnel is *not* as effective as the 60-pr. shrapnel at 7,500 yards, or at ranges approximating thereto, or in fact at any ranges, in respect to depth of zone covered by effective shrapnel.

We now have to consider (2) Is it necessary to consider ranges over 7,500 yards at all? Major Knapp thinks 7,500 yards "sufficient for all practical purposes in any theatre of war," owing to the difficulty of observation at "longer ranges."

It is however at ranges over 7,500 yards that heavy artillery expects to achieve its most important results: it will be readily admitted that enfilade fire is at once the most deadly and at the same time the most difficult nature of fire to obtain, owing usually to the impossibility of taking an enfilading position without coming so close to another portion of the enemy's line that the enfilading batteries are certain to be wiped out before they can establish an effective fire. But the long range of the 60-pr. enables a heavy battery to take a position for enfilade fire so much further from the enemy's line, while still in prolongation of the line to be enfiladed, that what would be out of the question for a field battery is perfectly practicable for a heavy battery.

Many instances could be quoted from the Russo-Japanese War, in which long range shrapnel fire of heavy guns for enfilading the Russian artillery positions, when they could not be reached effectively in any other way, would have been invaluable. The two most notable of these were:

(1) The attack by the Japanese II Army on the redoubtable Shon-shan position before Liao-ying. In this case the Russian batteries were so admirably placed that nothing could touch them, and the Japanese were utterly unable to carry the position until a successful night attack brought the 48 hours' fighting to a close just as the Russian Commander in Chief had issued orders to retire. Practically the only vulnerable point in the position was the prolongation of the Russian right flank towards Wang-chi-tung; a heavy battery placed near this point could have enfiladed the whole line at ranges of from 7,000 to 9,000 yards, closer ranges were impossible to obtain owing to the commanding hill on the Russian right flank which dominated the entire plain and was situated at a distance of 6,000 yards from Wang-chi-tung; thus, although prohibiting a nearer approach to the Russian position was a separate from the group of hills on which the main Russian artillery position was so cleverly concealed from the front, and was separated

therefrom by a plain 500 yards in width; the commanding hill, being in echelon to the rear of the prolongation of the artillery position, allowed a clear view to be obtained from the neighbourhood of Wang-erh-tung across the plain along the rear of the group of hills occupied by the artillery. There was however no heavy artillery available.

(2) Again at the battle of Ta-shi-chiao, the batteries of the Japanese right wing, though twice as numerous as those of the Russians, were unable even to locate the guns opposed to them, which swept all lines of approach so successfully that the Japanese frontal attack failed throughout the day in their portion of the field; and it was only by a costly night attack that the position was ultimately carried. In this case, there was a position near Sung-chia-tun in the Japanese centre from which the Russian artillery positions opposite the Japanese right could have been taken in enfilade by heavy artillery at ranges of from 5,000 yards to 8,400 yards. Here again however there was no heavy artillery available.

It would be easy to multiply instances in which effective fire at ranges over 7,500 yards would have been most valuable, but we have to meet the argument brought up against these longer ranges, owing to "difficulty of observation." Now this argument cannot be allowed to hold water for an instant; it presupposes that observation must always be from the position of the battery, whereas in practice such will seldom be the case at long ranges: there is in fact no limit to the proximity to the target of the battery commander, observation officer, or staff officer of artillery who may be controlling or directing the fire, except such as is imposed by the presence of the enemy, provided that telephone communication has been established between him and the battery: there is nothing new in this, it is part of our regular training in the heavy artillery; and towards the end of the Russo-Japanese War, Captain B. Vincent, R.F.A., tells us that "in the III Japanese Army, artillery officers were sometimes sent forward with hand shields and telephones, whose duty it was to keep so far as possible with the advancing infantry and to send back their observations to the line of guns."

Having dismissed the question of (1) the superiority of the 60-pr. gun in regard to depth of effective shrapnel zone at long ranges under 7,500 yards as compared with the 18-pr., and (2) the utility of firing at all at ranges over 7,500 yards, we pass to another point.

Major Knapp argues that "in carrying out any task, the field guns can fire more than three times as many shells as the 60-pr. guns without any greater proportionate expenditure of ammunition, and the effect of their fire should be greater on account of the larger number of bullets which are poured upon the enemy's position." As regards the greater "number of bullets," this only amounts to about 10 per cent, and at long ranges the harder hitting and deeper searching of the 60-pr. shrapnel bullets would probably fully compensate for their slightly smaller numbers.

Dismissing this portion of the argument then, we must readily admit that the 18-pr. Q-F. gun is immeasurably superior to the 60-pr. for covering any given area with the largest possible number of bullets in the shortest possible space of time, and that "the moral effect of losses occasioned by fire in any particular part of the battle field during a short space of time is much greater than that of an equal number of casualties which are spread over a longer period."

But the 60 pr. does not come into competition with the 18-pr. here; this role is essentially that of a Q-F. gun; it may, under special circumstances, be necessary to supplement the fire of the field artillery—as Field Artillery Training, p. 222, says:—"Occasions may well arise, when to gain decisive results, it will be necessary to mass heavy guns in line with those of lighter calibres;" this will usually be the case at long ranges. It is well to note, in connection with the argument that three 18-pr. shrapnel are more effective (10 per cent more bullets) than one 60-pr. shrapnel—that the total number of rounds per gun earned for the 18-pr. (508) in front of the advanced depot is considerably less than three times the total number of rounds earned for the 60 pr. (250) and slightly less than three times the number of shrapnel (175). It is however true that three 18-pr. shell weigh less than one 60-pr. shell.

The essayist very truly remarks that "judging from the Russo-Japanese War it is vain to think that hostile guns can be silenced by the destruction of material"; this remark is equally as true now as it was in 1870 and really emphasises the necessity for a long range shrapnel gun, which will be able to take the enemy's artillery positions in enfilade or even in reverse. (See examples given above—Shou-shan pu and Tashichiao). The plan for a heavier howitzer equipment as a "means of attacking the personnel of batteries behind their gun shields" does not seem to have any particular weight, since this role can be performed equally well by the field artillery howitzer or the new one, especially when in combination with heavy gun enfilade fire.

The next occasion in which the essayist advocates howitzer fire in preference to gun fire for a heavy battery is for the support of the firing line in the final stages of the assault. (Combined Training 1906, p. 117). But here again the field artillery howitzer can do all that a heavy howitzer could do and do it quicker and better. This is essentially an occasion for getting as close to your enemy as possible; the great mobility and the rapid fire of the field artillery howitzer, as compared with a heavy howitzer, make this its special role.

Although the heavy howitzers would not be of any particular value in this case as compared with the field howitzers, the heavy guns on the other hand would be invaluable. Their enfilade or cross fire would produce results quite beyond the power of any howitzer to produce. Any one who has been close to the targets in the previous range cannot fail to have been struck with the difference between the gentle patter of the howitzer shrapnel bullets and the

angry whizz of the 60-pr. shrapnel bullets—it is like comparing rain with hail.

Major Knapp does not take enfilade fire into consideration when he says that “effective support can only be given if fire is maintained upon the enemy’s position *over the heads* of the attacking troops up to the latest possible moment in the assault, and *this can only be done with safety by high angle fire.*”

We now come to another branch of the subject, *viz.*, the destruction of material in connection with the attack of “localities, buildings, and entrenchments”—(Field Artillery Training, 1906, p. 222).

Major Knapp first considers “woods” under the head of “localities.” I agree with him in thinking that the lyddite shell of the 60-pr. would not be very effective; but on the other hand I cannot go the length of agreeing with him in thinking that “the moral effect of the powerful high explosive (heavy howitzer shell, dropping into and bursting inside the wood, could not fail to be terrifying to the occupants.” In the first place the attack on the wood would be rather in the nature of a general bombardment, “firing into the brown” so to speak; and in the second place, I can imagine the occupants of the wood regarding the local effect of these shell with considerable equanimity, especially if they had the sense to select soft ground for their cover.

It seems also questionable whether “against buildings and villages, heavy howitzers” (*i.e.*, howitzers suitable for the heavy artillery of the field army) “with their powerful shell, and the steep angle of descent of these projectiles, will produce greater destructive effect than heavy guns.” Probably within the limits of the howitzer’s range, either gun or howitzer would be equally effective with lyddite shell, but at longer ranges, *i.e.*, outside howitzer range, and where enfilade fire is required, the advantage of the heavy gun will at once be apparent. During the Russo-Japanese War, there were many instances in the battle of the Sha-ho and in the battle of Mukden of determined village defence; in the latter battle, villages were converted into forts mutually supporting each other, and were in some cases so formidable that siege ordnance and siege operations were requisite for their capture, *e.g.*, Kan-kuan-tun and Yang-shi-tun, south of Mukden, which successfully resisted the determined attacks of the Japanese 8th Division for four days, and were not even then captured by assault: in such a case, the heavy artillery of a field army, whether armed with howitzers or guns, is scarcely suitable for coping with the situation unaided; it is an occasion for medium siege artillery mobile brigades.

During the battle of the Sha-ho, the Japanese attack on the village of La-mu-tun affords a good instance of what might have been effected by heavy guns, if they had been available: the prevailing flatness of the country, studded with villages, offered no well defined positions for defence, and rendered the effective employment of field artillery by the attack, most difficult: La-mu-tun and its approaches were swept by Russian artillery fire, and though the

Japanese, with desperate bravery, succeeded in carrying the village after losing heavily, they were unable to issue from it or hold it, and the Russian counter-attack speedily drove them out again—the battle swayed backwards and forwards at this point for several hours, but if the Japanese had been in possession of a heavy battery, and brought it into action on the high ground between Chang yu-tun and San-chia-tsz at a range of 8,800 yards from Russian batteries, it would have at once dominated the situation, kept the fire of the Russian batteries in check and swept the whole field between their artillery position and Lamou-tun at ranges from 8,800 yards to 5,000 yards and absolutely prohibited any counter-attack. It will be observed that the attack of a village, which is apt to be treated as an isolated operation, in discussing the most suitable kind of artillery for the purpose, is on the contrary a problem which usually has to be considered in connection with a larger tactical operation—in the instance just given, the Japanese had been offered a choice between a battery of 60-pr. guns ranging with shrapnel up to 9,500 yards and with high-velocity to 10,400 yards, and a heavy howitzer battery ranging up to 7,500 yards, with its necessarily less effective shrapnel; there would have been no two opinions as to which they would have preferred.

There is another point which deserves notice when comparing the effectiveness of howitzer and gunfire, *i.e.*, the time of flight—at long ranges, the time of flight of the howitzer shell will be about three times as long as that of the 60-pr. gun shell; this is a factor which cannot be safely ignored in field operations—to put it plainly a 60-pr. gun battery will get its first effective time shrapnel while the howitzer battery is still engaged in ranging.

From this point Major Knapp proceeds to explain why a heavy howitzer is required in addition to a field artillery howitzer, and why the heavy howitzer should be included in the heavy artillery establishments of the field army. He says:—“the fire of Q. F. guns compels an extensive use of cover, which in its turn necessitates a greater use of howitzer fire.” Up to a certain point field howitzer will be sufficiently powerful and more sustainable than the heavier weapons, but the employment of field howitzer reacts in its turn, and necessitates the use of strong head cover. This leads to a general improvement in the construction of field fortifications, and so increases the value of heavy howitzers. No one can fail to agree with this, but as it is a valid argument for replacing the guns of our heavy batteries in the field army by howitzers. It appears that the occasions on which field fortifications of the type suggested are encountered, such as was a very rare case at Leuwyang and Mukden, are the very occasions provided for on page 2 of *Course in Artillery Training* 1900, Vol. II.—“Major engagements will be forced and organized as in the case of a battle, it is intended that an action should be regarded for as an engagement, they should be organized and prepared for work in a battle.” My argument is not that heavy howitzers are of no use, but that since it is our duty to put them in position to the

field artillery howitzer is confined to the destruction of field fortification, its rôle is of an occasional or special nature and not normal to the requirements of a field army; this being so, that heavy howitzer batteries should not be incorporated in field army establishments as integral parts of field army formations, but should maintain the separate organisation which is provided for them as siege units, and that, as such, every effort should be made to render that organisation a practical working reality in our combined peace training—in fact that the medium siege brigades should be regularly brought into contact with the field army for occasional combined operations, although not normally incorporated in the establishments of the field army as component units thereof.

It is necessary to keep very clearly in mind what is feasible for a field army, as such, to carry out; and it may be accepted that the *destruction* of earthworks, entrenchments, and *strongly* fortified villages, is not practicable for the artillery of the field army, whose rôle in this connection must be confined to making such works or defences *temporarily untenable* or, at all events, *useless for offence*, at critical phases of the attack: if these defences are of such a formidable nature as to require actual demolition, this must partake of the nature of a siege operation, and suitable siege ordnance brought on to the scene to co-operate with the heavy artillery of the field army.

Major Knapp quotes the action of some of the leading military powers in support of his contention for howitzer instead of guns, in the heavy artillery of the field army, but it is not quite clear why we should take these authorities unquestionably as our guides in this matter. The primary object of the heavy artillery of a continental power is—to quote the German Regulation—"to pave the way for the infantry attack against strongly fortified positions and forts d'arrêt; but whilst the sphere of mortar battalions is, in this respect, a limited one, the action of howitzer battalions more closely resembles that of other arms on the battlefield and they will be found a valuable support to the field artillery engaged with the hostile artillery." In other words, the field armies have to get through the line of barrier forts which jealously guard continental frontiers, with the least possible delay, in order to operate in their enemy's territory, and therefore, what we might term medium siege brigades, are in the German army *attached* to each Army Corps: I say "*attached*" advisedly, as they will be distributed on mobilisation as required, and will not in war, necessarily accompany the Army Corps to which they are attached in peace. Germany is the only continental power which can be said to have organised heavy artillery on a permanent basis: the German heavy artillery is armed with howitzers on travelling carriages and mortars fired from platforms or beds.

The French have made a serious start with their Raimbault howitzer, and in a couple of years perhaps will have a complete permanent organisation.

The Japanese, who are not under the same restrictions as continental powers, have just made a beginning with "heavy field

artillery"; so far, the armament is confined to howitzers: it seems possible that the difficulty, which they would have in horsing heavy guns, may account for the fact that they seem to have limited their views to howitzers; for, as Major Knapp correctly points out "in the matter of mobility, howitzers are more suitable, as heavy artillery weapons, than guns; for it is possible to manufacture a howitzer equipment of much less weight than a gun equipment, which fires an equally heavy shell" (but has a shorter range) "and so greater mobility can be obtained without any sacrifice of shell power" (this is not correct as regards *effectiveness* of shrapnel). This argument may possibly apply to cases in which suitable draught power for heavy guns cannot be provided; but howitzers can never take the place of heavy guns under conditions which call for effective shrapnel fire at ranges outside the effective limit of field guns (this does not refer to searching behind cover, which is necessarily the rôle of howitzers); the rôle of the heavy howitzers will be primarily the destruction of material which is beyond the power of the field artillery howitzer to cope with, and, secondarily, to "furnish a valuable support to the field artillery engaged with the hostile artillery." But is it worth while for these objects to include howitzer batteries in the heavy artillery of a field army formation, instead of attaching them as required from medium siege brigades—the latter being organised and trained accordingly, with this object in view?

And here it should be noted that Major Knapp actually contemplates an organisation for the heavy howitzer batteries, which corresponds more nearly with that of the medium siege brigades, than with that of the heavy artillery which now forms an integral part of every Division. He says:—"But when the heavy artillery is armed with a modern heavy howitzer capable of fulfilling the purpose for which it is now required, *viz.*, preparing the way for the infantry attack on fortified positions, it will be essential, for the proper performance of this work, that the batteries be brigaded together once more in the corps artillery": in this I fully agree, but would go a step further, and call them "medium siege brigades," to be attached to army troops as required, and train them in the siege artillery school instead of in the field artillery school, but attach them to the field army from time to time for combined operations.

We must now pass on to the question of heavy artillery for India. Major Knapp says of the 60-pr:—"This equipment would be utterly unserviceable for employment across the frontier of India, on account of its excessive weight, which would soon reduce the batteries to a state of immobility."

This is indeed serious, and requires most careful consideration: it must be remembered however that Major Knapp is opposed to the heavy guns for quite other reasons, and would not have them at any price, no matter how mobile they might be, as he maintains that their functions can be better performed by field guns and heavy howitzers. This being the case, it seems desirable for those who believe in the tactical rôle of the 60-pr. batteries to ask if the

possibility of using this gun in heavy batteries, across the Indian frontier, has been exhaustively discussed, and what data of an experimental nature exist, upon which to found the dictum that "they would be utterly unserviceable." It must be borne in mind that Major Knapp is not content with the "walk" as the normal pace of heavy artillery; he says:—"Heavy artillery equipments should be sufficiently mobile to allow of batteries moving several miles at a trot in case of emergency": under such conditions it is easy to conceive that the 60-pr. equipments, if employed across the frontier of India, would, indeed, speedily become "utterly unserviceable."

The experience of the South African War, and, I might add, of the Afghan War, shows that our Generals have never hesitated to place heavy batteries well to the front on the line of march when occasion requires it: in Southern Afghanistan, a heavy battery was the first battery of the main body to enter the Bolan Pass: in South Africa the heavy artillery was close to the head of the column at Botha's Pass, and at Gansvlei the 4·7 guns were in action before any of the field batteries, again at Alleman's Nek the heavy artillery was well to the front. It is thus by judiciously arranging the column of route, and not by "moving several miles at a trot," that the requirements of any situation can best be met by the heavy artillery. Colonel May in his "Retrospect of the South African War" treats this part of the question fully and conclusively, and Major Jeudwine in his Gold Medal Prize essay is equally clear as to the position on the line of march.

It is to be feared that the evolution of Major Knapp's ideal would bring the heavy artillery perilously near the reproach of being "bad field artillery"—a consummation which I feel sure he would be the first to deprecate. Coming into action at a trot, *when under fire or in an open position*, is another matter altogether; it will not hurt the horses to trot a hundred yards just before they are going to have a long rest, while the battery is in action, neither will it unsteady the gunners even if they are not mounted as Major Knapp proposes: but the trot should be strictly limited to the occasions when the situation requires it, as defined by italics.

Walers have been found satisfactory for the existing heavy batteries in India, and it may be observed that their limit of useful draught has not been exhausted; teams of 12 horses were successfully employed in South Africa, and experience has shown that the efficiency of any team can be increased 33 per cent if "relief" horses are provided at the same rate; in fact, it will pay better as a rule with 12 horses, to put only 8 in the team at one time, and employ reliefs of 4, so that each horse will only be in draught for two-thirds of the whole time occupied in making a march; the whole of the horses can always be put in draught to get the guns over temporary difficulties. It goes without saying that long teams require the best driving, and it is essential that the No. 1 should be mounted in order to supervise the driving, if for no other reason. (There are, of course, other and weighty reasons.)

Again, it has not been proved that the heavy horses weighing 1,400 lbs., which we employ in the heavy batteries at home, are unsuitable for India, it would surely be worth while to try them : horses of this stamp will always be bred in England for farm work and van work, as well as for station and yard work on the railways, so that there is not the same prospect of the supply running short as there is in the case of every other kind of horse for the army.

This brings my review to a conclusion, since I agree with the valuable recommendations which Major Knapp makes in regard to pack howitzer equipment, and siege artillery generally. It is due to the ability with which he has argued the main question—heavy howitzer *versus* heavy gun—that I have considered it necessary to deal at such length with the issues raised, believing as I do, that the question is one of vital and far-reaching importance, and fearing that, in default of critical examination of the validity of the arguments adduced and the conclusions arrived at, many readers might too hastily assume that there were no other aspects of the case than those so ably handled by the writer of the “commended” essay.

PRECIS OF FOREIGN MILITARY PAPERS.

RUSSIAN PAPERS.

VOENNI SBOBNIK—JANUARY 1908.

The Psychology of War.—A. Rezanof. Every soldier who has been in action realises the profound truth that the moral factors in war are far more important than the material. This fundamental fact is in constant danger of being overlooked; in times of peace, it is very easy to forget that the conventional assumption, in all tactical and strategical problems, that 100 men equal 100 men is essentially untrue and has been adopted for convenience only. On the actual field of battle no two bodies of men of the same numbers (given equal tactical training, equipment and physical condition—a most improbable condition) have been, or ever will be, equal in moral force. Differences of race and temperament alone forbid it. Book and manœuvre-trained officers find it very hard to realise this fact and the study of technique has very much outrun that of “moral.”

Napoleon's dictum that the moral is to the physical as 3 to 1 is generally admitted to give the correct proportion, but what are the moral factors which go to make up an army's fighting power? Generally speaking, the ability and prestige of the General and the “moral” of the troops. It is, of course, impossible to express the value of these factors mathematically. Wellington's private, in stating his opinion that the Dook's long nose was worth a Division, probably went as near as is possible to a quantitative expression of the first. An army feels the second perfectly well, it knows when it has the moral force necessary for an advance and when the exhaustion of that force renders a retirement inevitable (c.f. the feeling among the troops on Spion Kop). If, however, we admit the importance of moral factors in war, the difficulty of their study is not a sufficient reason for abandoning it in despair. The successes of the greatest commanders have mainly been due to the fact that, to a perfect mastery of the technique of war, they added an ability to appreciate the value of these indefinable factors. The power to perceive when a moral superiority makes the offensive possible, especially distinguishes the great General. Suvorof's victory at Rinnik with 7,000 Russians and 18,000 Austrians over 100,000 equally well-trained and well-armed Turks, Napoleon's apparently miraculous success at Arcola were not due to mere luck. In each case the high “moral” of their troops (combined, of course, with first-class leading) made possible the, materially, impossible and the Commander had the genius to recognise the existence of this invisible superiority. The comparative value of the moral factors has certainly not decreased since Napoleonic times; extended formations, the effect of modern artillery fire, and the length of the battles of to-day make tremendous

demands on all ranks. The experiences of the Japanese war have convinced Russian officers that questions of "moral" are most important and must be studied.

After all, these questions are merely a part of the problems of Collective Psychology. A good deal has been written on the psychology of crowds and a military unit is only a crowd with a very definite "collective" character. An assembly of individuals, subjected to a uniform training, open to the same influences and actuated by common motives, rapidly acquires a "collective" character. Its individual members are compelled to feel, think and act in a manner entirely different to that in which they would feel, think and act as separate individuals. No one who has formed part of a crowd at any time of excitement can have failed to notice the way that waves of feeling traverse it—waves that one seems to feel physically, so great is the power of suggestion of the mass on the individual. In the stress of battle, when every faculty is strained to the utmost, this is still more marked—the coward or one who thinks himself such, forgets, under the influence of the moral power of his comrades, his consciousness of cowardice and presses forward with the best, actuated by the same motives of patriotism, and self-sacrifice. In short, he loses his individual character in the collective character of the body to which he belongs. Military discipline both welds a mass of individuals into a moral whole and subordinates that whole to the will-power of its leader, the unity of thought of the mass and the completeness of this control are the tests of the excellence, or otherwise, of our methods of training.

The writer concludes by expressing a hope that more interest will be taken in future in the study of this obscure, but most important, subject.

VOENNI SBORNIK—FEBRUARY AND MARCH 1908.

Organisation of the Chinese Army.—Only a few years ago China was a military nonentity, but the events of 1900-01 convinced the Government of the necessity of a modern army. Since then great improvements have been effected and the growth of the Chinese army is one of the most interesting phenomenon of the day.

The movement is mainly the work of Yuan-Shi-ki, an enlightened official of great force of character, who has been fortunate enough to secure the support of the Dowager-Empress. The manœuvres of 1905 and 1906 have convinced foreign observers that an army of considerable military value has already been created.

The Chinese War Office, situated at Peking, exercises a general control over the course of the reorganisation, but the cost of the maintenance of the various divisions falls on the Provincial budgets; the efficiency and training of the troops therefore varies with the character and energy of the Governors of Provinces. The divisions of Northern China have undoubtedly attained a higher standard than those of the more distant parts of the Empire. Recruiting is carried out locally, districts having to furnish a quota

according to population. No bad characters or opium smokers are accepted. The total period of service is 10 years, 3 with the colours, 3 in the first class Reserve and 4 in the second. The first class Reserve is to come out for a month's training every year, the second every other year. In the event of general mobilisation, all who have served are liable to recall up to 45 years of age. So far the Reserve exists only on paper.

Candidates for commissions pass through the Military Academy (course 2 years); they then do a probationary course of 1½ years with a regiment. If favourably reported on, they return to the Academy for the final examination. They must be of good family and own a certain amount of land.

The organisation is, generally, on the German model. Infantry battalions, "yings," have 4 companies and 3 "yings" form a regiment.

The cavalry regiments have 3 "yings;" an artillery regiment has 3; of these 2 are field artillery (=6 batteries) and one mountain (3 batteries). All batteries have 6 guns. Neither the cavalry nor the artillery are satisfactorily horsed; the mobility of the latter in bad country is distinctly low.

The highest permanent unit in peace is the division of all arms. This consists of 2 brigades of infantry (12 battalions), 1 cavalry regiment, 1 Regiment of artillery (9 batteries), 1 engineer and 1 transport battalion. There is also a divisional band of 54 men. On a war footing the division has 13,224 bayonets and 765 sabres with 36 field and 18 mountain guns. Proportion of guns to combatants 3·9.

Transport would be obtained by requisition: the arrangements in this respect do not appear to be satisfactory. The non-combatants in a division number 3,166. Total number of all ranks, combatants and non-combatants, 20,922.

To judge from manœuvres 3 or 4 divisions would, in war, be combined to form a corps. Reserve divisions are also to be formed on mobilisation from Reservists surplus to the requirements of the field divisions. No reserve of officers exists at present.

The enormous distances that separate the provinces from each other and from Peking make the question of communications one of the greatest importance. Railway construction, as far as possible with Chinese capital, is being pushed on with considerable energy.

The most important line, from a strategical point of view, is the Peking Hankow of 750 miles, opened in 1905, which enables the Southern Divisions to be brought up to reinforce the Northern troops. A line to Canton will shortly be opened. From a Russian point of view the line Peking-Kalgan with its projected extension to Urga, and the bold proposal to run a railway to Kulja are worthy of note. Kulja is within 50 miles of the frontier of Russian Turkistan. Peking, in fact, is destined to become the centre of a system of railways radiating to the most distant frontiers of the Empire and China will then be able to concentrate her force in any required direction.

It should be remarked that at present reorganisation is far from complete: the numbers given are in most cases far from being actually with the colours. Some divisions in the south are in a very backward condition.

RAILWAYS IN AFGHANISTAN.

The *Razvyedchik* of 29th April 1908 has some remarks on the news of the commencement of the Mohmand expedition and of the attack by Afghans on Landi Kotal. The small amount of interest taken in the telegrams on these subjects in Russia is most surprising: a few years ago they would have caused the greatest excitement, particularly in military circles. The Japanese war has certainly made great changes, but the problems of Central Asia are still most important to Russia and must be studied.

The truth is that the Russo-English Convention has done much to dispel the mists of distrust which always used to overshadow the relations of the two Powers, and it is to be hoped that this improvement in their mutual feelings will lead to that much-to-be-desired end—the linking-up of the Russian and Indian Railway systems. The Indian Government has, up to now, always been afraid to deal firmly with the Amir for fear of throwing him into the arms of Russia. Although in receipt of an annual subsidy of 18 lakhs of rupees (£120,000) the conduct of Abdur Rahman was highly unsatisfactory. He was always encouraging the frontier tribes in their risings against British authority and his son is doing even worse. In Abdur Rahman's time large bodies of armed Afghans never dared to cross the English border and engage Anglo-Indian troops, whatever injury the late Amir may have done his "ally" by the moral support he lent rebels. The Indian Government is now in a position to take vigorous action both against the tribes and against Afghanistan. There is no doubt that the most effective method open to them is to advance their railways into the latter country. Russian experience in Central Asia proves that without railways no permanent pacification of marauding tribes is possible. The construction of the Trans-Caspian broke the power of the Turkomans and their raids, which carried terror over the whole of Northern Persia and Central Asia only 30 years ago, are now mere food for legends.

If the British seize the opportunity, offered by the friendly attitude of the Russian Government, of settling the frontier question once and for all by pushing their rail heads to Kabul and Kandahar, a junction of the two railway systems will become inevitable. Considering that they are a nation of shop-keepers, the suspicion with which the English always regard any suggested improvement of their communications with their neighbours, is extremely curious. The history of the Channel Tunnel project illustrates this. The undoubted commercial advantages of the scheme and the strength of the present *entente* with France are not sufficient to break down their mistrust of their neighbours and the dislike they feel to sacrificing their insular position.

However, the advantages of an immediate extension of the Indian lines are too obvious to escape the attention of the most practical nation on earth, and we may hope to see interesting developments in this direction in the near future.

RUSSIAN MUSKETRY.

In the *Razvyedchik* of 29th May 1908 there is an article by a cavalryman which is rather interesting in view of the fact that Indian Musketry returns show that the shooting of the cavalry is now as good as that of the infantry. The Russian officer points out that their provisional Musketry Regulations of 1906 require the same standard from the cavalry as from the arm whose special business it is to shoot. A cavalryman's time is mainly, and rightly, spent on learning his duties as such and the demands now made are unreasonable. The Regulations of 1899 laid down different courses for the cavalry and infantry. The mounted branch is also handicapped by its shorter (difference $2\frac{3}{4}$ inches) and therefore less accurate rifle, by the fact that it receives only half the annual allowance of rounds given to the infantryman and by the want of ranges, cavalry having none of their own.

A more lenient classification is therefore suggested: the standards proposed throw considerable light on the musketry qualifications of the Russian cavalry. The author takes the 5 classifying practices of the present Regulations, *viz.*:—

- (i) 310 yards. 4 shots, independent. Lying without rests. Head and shoulder target.
- (ii) 310 yards. Same but two head targets (15 inches high) placed side by side.
- (iv) 310 yards. Vanishing head and shoulder target exposed for 5 seconds. 5 rounds.
- (vi) 470 to 540 yards. 2 head and shoulder targets side by side. 5 rounds in thirty seconds.
- (vii) 1,090 yards. 2 rounds lying, with rest, and 2 kneeling. Target, 9 figure targets in line. These figures are 5 feet high, so the target cannot be less than 5 feet by 18 feet.

Classification is by percentage of hits to rounds. The present classification (for all arms) is—60 per cent of hits "excellent," 45 per cent "very good," 30 per cent "good," and anything lower unsatisfactory. The author proposes a much lower standard for cavalry, varying for each practice—25 per cent to 20 per cent "excellent," 15 per cent to 10 per cent "very good," and 10 per cent to 8 per cent "good" according to the supposed difficulty of the practice, (i) and (vii) being the easiest and (iv) and (vi) the hardest.

It may be remarked that the annual allowance of the cavalry is 59, that of the infantry 117 rounds. Of the 59 rounds the former spend 9 on preliminary practices, 22 on the classifying practices given above, 8 on preliminary and 20 on final field practices. Infantry

expend 12, 43 (in 9 classifying practices), 22 and 40 respectively. Their annual allowance is 33 rounds less than that of our Native Army.

A man who is classified as "excellent" two years running wears a marksman's badge on the breast. It is calculated that, owing to the exemption of bandsmen, officers' servants, etc., 10 per cent of the infantry are not exercised in musketry in any given year.

Practice (iv), described above, has a special interest. It corresponds to practice VI, Part II of the existing regulations for the Native Army, the Russian soldier firing from 310, instead of 200, yards at a target (in both cases head and shoulder) exposed for 5 seconds, instead of 4. If he obtains 3 hits in 5 shots he is classified as "excellent," for 45 per cent (a little over an average of 2) he obtains "very good," while 30 per cent entitles him to the classification "good." It is doubtful if the remarks of an Indian Double Company or Squadron Commander whose registers showed an average of $1\frac{1}{2}$ hits in practice VI would be of a particularly appreciative character.

The author proposes new conditions and a lower standard of classification for Cavalry Field Firing practices.

He would also substitute 470 for 390 yards in the Squadron Attack or Defence Field practice from 2,100 to 390 yards and suggests targets of various sizes and some moving.

He then says that the Japanese war has certainly shown that cavalry must be taught to shoot, but it merely discourages the men to demand an impossibly high standard from them. If the authorities insist on the cavalry shooting as well as the infantry, it will mean a loss of efficiency in their proper rôle. They ought, however to encourage shooting among officers and give liberal prizes for proficiency in shooting, judging distance and range taking. For rifle shooting there ought to be collective prizes for all units, from troops up to corps.

GERMAN PAPERS.

Militär Wochenblatt.

Among the January and February issues of the above journal, the following articles of general interest are selected for special notice:—

1. "*French views regarding the supplementing of cavalry divisions by infantry cyclists and infantry on foot.*"

The article deals with the proposals of military authorities in France regarding the methods to be adopted for removing, as far as possible, the great disparity in strength which admittedly exists between the French and German cavalry. The inferior strength of the French cavalry has given rise to a problem which is no less applicable to ourselves, and it is therefore perhaps worth studying how our nearest continental neighbours propose to deal with the difficulty.

The conditions, briefly, are these: Germany has a numerical superiority of 102 cavalry regiments as against 79 in France. The former are uniformly armed with the lance, while the latter consist of heavy and light cavalry armed with the sword.

The French consider the most effective means of successfully meeting German cavalry to consist in providing the whole of their heavy cavalry with cuirasses. In cavalry combats it is apparently only the heavy cavalry who are considered a match for or even superior to German lancers. Accordingly, as a preliminary step towards increasing the fighting power of the cavalry as a whole, the cavalry divisions have been re-organised so as to distribute brigades of heavy cavalry among six out of the total of eight divisions, instead of having four heavy and four light divisions as formerly. Further, to increase the strength of the cavalry two machine-guns are to be allotted to each division. The machine-guns are mounted on carriages, each drawn by four horses, so as to secure extreme mobility, and to enable them to follow their divisions over any ground.

The re-organization of the cavalry divisions, and the employment of machine-guns are, however, by no means considered sufficient, and the French have been constantly striving to find additional means of increasing the fighting capacity of their cavalry. With this object, proposals have been made to supplement the cavalry divisions with bodies of infantry cyclists and infantry on foot. The infantry cyclists (companies or battalions) will form a fixed complement in each cavalry division, and owing to their great mobility will be able to follow the cavalry even when off the regular roads, as

owing to the special construction of the bicycles (*bicyclettes pliantes*) they are able in France to move over ground that would otherwise be impossible for cyclists. They will be employed as advance and flank guards, as covering parties, for protection of posts on the lines of communication, and for purpose of inter-communication. In advance and flank guards they will be employed much as our mounted infantry, *i.e.*, to seize and occupy advanced positions, bridges, defiles, etc., pending the arrival of the main body. It is recognised that the preliminary work of reconnoitring and clearing the front can only be effectively performed by cavalry, but a body of infantry cyclists following close behind the cavalry patrols will add much to the strength and security of the latter by giving them greater freedom of action, and effective support by securing good tactical positions immediately in their rear.

The rôle of infantry on foot attached to cavalry divisions is to act as covering troops, to support the cavalry when acting on the offensive, and to check the advance of the enemy's cavalry if the latter are encountered in superior strength. The idea is that the infantry employed for these purposes should move off ahead of the cavalry or while the latter is in process of assembling. They would occupy all commanding features of ground towards the front giving an extended field of fire, and thus prevent the hostile cavalry patrols from reconnoitring the ground while affording a screen under cover of which their own cavalry division can subsequently advance rapidly in any given direction desired. In other respects the functions of this infantry will be much the same as that of the cyclist infantry.

A practical test of the above proposals took place in the manœuvres held by the 4th Cavalry Division on the 28th August 1906, and the comments of General Langlois on these manœuvres are therefore of interest as representing a considerable weight of French military opinion on the subject. In the General's opinion infantry on foot cannot co-operate effectively with cavalry. They impede the free and independent movement of the infinitely more mobile cavalry and there is always the danger, as illustrated in the manœuvres in question, of the cavalry leader being influenced and hampered in his action out of regard for the infantry portion of his command. If infantry is to be of any real use to cavalry its rate of march must be equal, and, if possible, superior to that of cavalry. Only then is it in a position to advance rapidly ahead of the cavalry and occupy threatened points for the purpose of carrying out the special duties assigned to it. Large cyclist detachments which can comfortably cover 15 kilometres on good roads are therefore well adapted to form an auxiliary to cavalry divisions. At the same time, it must be borne in mind, that the support provided by large bodies of cyclists to a cavalry which feels itself inferior is only helpful as a last resource, and auxiliaries of this kind can never have a decisive effect.

The question, therefore, how far cyclist infantry can make up for cavalry of inferior strength remains still undecided, but the

manner in which it has been proposed to utilise them in France may serve to elucidate a problem which is applicable to our own army when the disparity in the numbers of cavalry is even greater than that between France and Germany.

2. "*Experiences of the Japanese with machine-guns.*"

This article gives several instructive examples of the way in which the Japanese made use of machine guns during the late war and the lessons to be derived from their experiences. The following were some of the principal points noted:—

- (1) It was established that the moral effect of machine-gun fire within a radius of 1,500 yards was greater even than that of artillery. This is attributed to the fact that with artillery there is an appreciable interval between the moment of discharge and the impact of each shot which gives the defenders time to take cover. On the other hand, the uninterrupted hail of bullets from machine-guns allows of no such respite, and forces the defenders to keep continuously under cover.
- (2) The effect of machine-gun fire is usually regarded as equivalent to that of a company of infantry. In reality it is greater as owing to the steady platform and the sense of security afforded by a shield the firer can direct his fire with greater coolness and accuracy than when firing with the ordinary rifle.
- (3) Long range fire should as a rule be avoided. Fire to be really effective should be delivered within a range of 1,000 yards. Only in exceptional circumstances where a particularly favourable target presents itself, such as artillery in motion or close bodies of infantry, is it advisable to fire at distant ranges.
- (4) To judge of fire effect by observing the impact of the bullets is often impossible, but in such cases the behaviour of the enemy is usually a sufficient indication. Even troops of approved courage, when exposed to machine-gun fire, will show unmistakeable signs of its effect.
- (5) Firing by night is difficult not only because of the impossibility of taking aim, but because of the difficulty of loading in the dark. To obviate the latter difficulty a small electric lamp placed close to the breech and concealed from the enemy by the shield was found to be of the greatest advantage, and, in fact, indispensable. To secure as effective an aim, as possible, the elevation must be adjusted by day so as to fire horizontally.
- (6) A sufficient supply of ammunition is of vital importance. Experience teaches that nothing tends to greater waste than firing at distant ranges. Moreover, it entails the danger of being left with insufficient

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This brings my review to a conclusion, since I agree with the valuable recommendations which Major Knapp makes in regard to pack howitzer equipment, and siege artillery generally. It is due to the ability with which he has argued the main question—heavy howitzer *versus* heavy gun—that I have considered it necessary to deal at such length with the issues raised, believing as I do, that the question is one of vital and far-reaching importance, and fearing that, in default of critical examination of the validity of the arguments adduced and the conclusions arrived at, many readers might too hastily assume that there were no other aspects of the case than those so ably handled by the writer of the “commended” essay.

keeping carefully under cover from view moves to a distance of between 8 and 10 kilometres from the enemy's position in readiness to guard against any hostile sortie.

(b) *Preparing the attack.*—To prepare the attack and to cover the taking up of artillery positions, machine-guns usually proceed with infantry and artillery up to 1,000 yards from the enemy's position, and there construct cover. At this point they are employed to strengthen weak portions of their own line, or on the flanks. They must be in their respective places before the attacking artillery moves forward to take up its position, and, when this takes place by day, should, if necessary, provide covering fire in order to facilitate the advance of other troops.

(c) *Commencement of the attack.*—At break of day when the attacking artillery are in position, and open fire by salvoes to find the enemy's range, officers with machine-gun sections will endeavour to locate the enemy's trenches, and study the intervening ground with a view to the subsequent development of the attack. Fire should not be opened unless absolutely necessary.

(d) *Development of the attack.*—As soon as the front of the main attack has been decided on, the artillery opens fire at dawn, while the infantry by night, or in short rushes by day, advances against the enemy. During this period machine-guns are employed in giving covering fire.

When the firing line has worked to a distance of between 600 and 700 yards from the enemy, and there entrenched itself, the machine-guns must be brought up to the firing line in order to be at hand when the decisive fire combat begins. To carry out this, it may often be necessary to take the machine-gun to pieces, and send the separate portions forward by means of individual men working up to the firing line.

As soon as the firing line has been reached, officers with machine-gun sections must closely watch the enemy's movements. Should it become evident that the enemy has observed the approach of the machine-guns, and is bringing up artillery to medium range (about 1,000 yds.) in order to destroy them, an attempt must be made to overwhelm the horses and detachments of these guns by opening a sudden and heavy fire on them. Should this attempt fail, the only means of avoiding further losses is to get the machine-guns under good cover, or at least remove them to another spot.

Machine-guns can only be successful against the defender's artillery under certain favourable conditions of weather (dark nights, thick fogs, etc.), or when the formations of the ground enable them to approach unseen and make a sudden and unexpected attack.

(e) *The decisive attack.*—Before the final assault the infantry advances under cover of night to within 300 or 400 yards of the enemy's position, and then proceeds to entrench itself as strongly as possible. The machine-guns take no part in this movement, but remain in their former places. Their strength lies entirely in their

fire effect, and they are not suited for fighting at close quarters. Consequently, they must endeavour to aid the further advance of the troops without quitting the positions they have already reached.

The attacking artillery directs its fire principally against the main works of the enemy, but partly also against the trenches lying between the above, in order to smother the enemy's fire and thus prepare for the assault. This object is, however, not usually easy to accomplish if the enemy is strongly entrenched. Consequently, machine-guns must direct their closer and more accurate fire at the enemy wherever they may show themselves, and must endeavour to sweep their trenches in such a manner as to prevent them showing their heads above cover.

The assault is delivered simultaneously against both the main work and the adjacent trenches and batteries in the enemy's line. While this is taking place, the machine-guns continue to give support by covering fire, but a few may be sent on with the troops delivering the assault, in order to be in position for firing during the pursuit. Should the covering fire become dangerous to their own troops, the machine-guns must at once hurry forward, and will be employed either in repelling attempts at counter-attack or in aiding the attack on adjacent works in the enemy's line. The machine-guns with the reserve are also sent forward to be employed as may be necessary.

When in this position, it is of particular importance to attack all supporting defence works in the vicinity without delay ; otherwise, the troops penetrating the enemy's defences may find themselves compelled to form front on three sides, and if they are thus forced back, their giving ground may easily result in the whole attack proving a failure. To prevent this the utmost fighting capacity of the machine-guns must be employed, and their fire concentrated against decisive points so as to give the strongest support possible which must be sustained at all costs. The machine-gun detachment should be thoroughly conscious that their withdrawal at this critical period would spell disaster.

Several instructive examples, which are well worth studying, are given in the article to illustrate the principles for employing machine-guns as above enunciated, but space forbids the quoting of any of those in detail.

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The February number has an important article on the main artillery questions of the day *Dans l'Artillerie* which consists of opinions culled from current military literature. The first item is—

The Field Howitzer.

An article in the *Artilleristische Monatsheft* reviews three books by partisans of this weapon.

The first author, Major-General von Bahn, pronounces against shrapnel, pointing out that it is impossible to touch troops behind modern field works. He is in favour of a time and percussion fuze for the common shell. The calibre should be between 10 and 12 *cm.* for the 20 *kg.* projectile; the latter calibre gives the maximum permissible weight in field artillery. The author has no illusions as to the number of hits, but considers isolated rounds will have good effect.

The second author, Captain Roskoten, is of opinion (and in this General von Rohne supports him) that howitzers should be used in batteries of 4, and that 6 such 4-howitzer batteries should be attached to the artillery of an army corps (not to the division). He confines the employment of howitzers to fire against troops under cover, and the preparation of breaches, and would not use them for the artillery combat. All howitzers of the several army corps in action should be concentrated, and work together. They would assist the field guns in firing on the points of attack and employ shrapnel when the enemy occupied his works.

The third, Engineer of Artillery Kahn, would employ his howitzers against the same targets as field guns, especially troops behind ridges. For the attack of field works he recommends a special weapon. Thus he proposes a light Q.-F. field howitzer, with an 8 *kg.* shrapnel and a 10 *kg.* shell, with respective initial velocities of 330 and 300 *m.*; and a heavy howitzer of 15 *cm.*

The diversity of opinion on this subject is increased by the fact that such authorities as the French General Langolis are opposed to the introduction of the field howitzer in any form.

Increase of Field Artillery in France.—Comparison between French and German Artillery.—French Artillery Questions

These are articles by General Rohne in the same magazine.

The French war budget for 1907 shows that the French army corps has only 92 guns against the German 144, and the proportion for 1,000 rifles is smaller in France than elsewhere; the late war in the Far East is quoted to show the importance of artillery, and an increase of 800 to 1,000 guns is proposed. Also the report shows the

It should be remarked that at present reorganisation is far from complete: the numbers given are in most cases far from being actually with the colours. Some divisions in the south are in a very backward condition.

RAILWAYS IN AFGHANISTAN.

The *Ruzvyedchik* of 29th April 1908 has some remarks on the news of the commencement of the Mohmand expedition and of the attack by Afghans on Landi Kotal. The small amount of interest taken in the telegrams on these subjects in Russia is most surprising: a few years ago they would have caused the greatest excitement, particularly in military circles. The Japanese war has certainly made great changes, but the problems of Central Asia are still most important to Russia and must be studied.

The truth is that the Russo-English Convention has done much to dispel the mists of distrust which always used to overshadow the relations of the two Powers, and it is to be hoped that this improvement in their mutual feelings will lead to that much-to-be-desired end—the linking-up of the Russian and Indian Railway systems. The Indian Government has, up to now, always been afraid to deal firmly with the Amir for fear of throwing him into the arms of Russia. Although in receipt of an annual subsidy of 18 lakhs of rupees (£120,000) the conduct of Abdur Rahman was highly unsatisfactory. He was always encouraging the frontier tribes in their risings against British authority and his son is doing even worse. In Abdur Rahman's time large bodies of armed Afghans never dared to cross the English border and engage Anglo-Indian troops, whatever injury the late Amir may have done his "ally" by the moral support he lent rebels. The Indian Government is now in a position to take vigorous action both against the tribes and against Afghanistan. There is no doubt that the most effective method open to them is to advance their railways into the latter country. Russian experience in Central Asia proves that without railways no permanent pacification of marauding tribes is possible. The construction of the Trans-Caspian broke the power of the Turkomans and their raids, which carried terror over the whole of Northern Persia and Central Asia only 30 years ago, are now mere food for legends.

If the British seize the opportunity, offered by the friendly attitude of the Russian Government, of settling the frontier question once and for all by pushing their rail heads to Kabul and Kandahar, a junction of the two railway systems will become inevitable. Considering that they are a nation of shop-keepers, the suspicion with which the English always regard any suggested improvement of their communications with their neighbours, is extremely curious. The history of the Channel Tunnel project illustrates this. The undoubted commercial advantages of the scheme and the strength of the present *entente* with France are not sufficient to break down their mistrust of their neighbours and the dislike they feel to sacrificing their insular position.

2. The best method of making use of the great rapidity of fire is the *rafale*, that is, sudden, short and violent fire. This is the best to facilitate the advance of the friendly infantry.

These should be the basis of all artillery training, and the fact is observed in the next training regulations. But this is not the case in the new practice regulations, and accordingly General Rohne criticises the latter severely. The two main counts of the indictment are that too large a proportion of old matter is retained in the book (an inappropriate arrangement when it is a question of an entirely new equipment), and that too much attention is paid to detail. The critic also notices the influence of the alleged inferior sighting arrangement of the German gun. There is no independent line of sight, or panoramic sight. This affects the regulations. As an example of the excess of detail, it is observed that the rules for ranging inculcate the use of small corrections and occupy two whole pages, whereas in the French regulations the subject is efficiently treated in five or six lines.

The article closes with a consideration of the new organisation of the artillery in the English army. It shows that the largest unit is the "group" of two or three batteries, and discusses the object of this arrangement. The conclusion arrived at is that the organisation is extremely supple and elastic, and well suited to the new conditions of extended fronts. With the group system the divisional artillery of two or three groups can be split up, and attached to brigades as required.

The Austrian correspondent has some useful notes in this number on the vexed question of the use of machine-guns. He quotes a paragraph from *Streitfleurs Militärische Zeitschrift* which lays down that with the extended fronts of the modern battle it is desirable that machine-guns should be attached to regiments of infantry in order that their fire may be dispersed as required; but that in the cavalry such an arrangement would introduce numerous complications and therefore, on the whole, it is preferable for machine-guns to be organised in separate units.

The Austrian theory is that one machine-gun is equivalent in fire-power to a section of infantry; whereas the Japanese say a whole company. Experiments have shown that a section at 800 yards will annihilate a machine-gun detachment of 5 men. But the analogy does not hold good with the longer ranges of war. The facts of actual warfare go to prove that the machine-gun is an extremely powerful weapon, and its effect is most demoralising.

The importance of the machine-gun is recognised to a somewhat exaggerated extent in some quarters. The *Armeezeitung* would give 10 to each infantry company; and to provide a set off to the expense, this writer proposes to reduce the strength in men. *Streitfleurs* on the other hand holds that two is the maximum number of maxims that can safely be "massed" together. The shields, etc., form too conspicuous an object if there are more.

Again the difficulties of ammunition supply if the number of machine-guns with a unit is multiplied should not be forgotten.

expend 12, 43 (in 9 classifying practices¹, 22 and 40 respectively. Their annual allowance is 33 rounds less than that of our Native Army.

A man who is classified as "excellent" two years running wears a marksman's badge on the breast. It is calculated that, owing to the exemption of bandsmen, officers' servants, etc., 10 per cent of the infantry are not exercised in musketry in any given year.

Practice (iv), described above, has a special interest. It corresponds to practice VI, Part II of the existing regulations for the Native Army, the Russian soldier firing from 310, instead of 200, yards at a target (in both cases head and shoulder) exposed for 5 seconds, instead of 4. If he obtains 3 hits in 5 shots he is classified as "excellent," for 45 per cent (a little over an average of 2) he obtains "very good," while 30 per cent entitles him to the classification "good." It is doubtful if the remarks of an Indian Double Company or Squadron Commander whose registers showed an average of $1\frac{1}{2}$ hits in practice VI would be of a particularly appreciative character.

The author proposes new conditions and a lower standard of classification for Cavalry Field Firing practices.

He would also substitute 470 for 390 yards in the Squadron Attack or Defence Field practice from 2,100 to 390 yards and suggests targets of various sizes and some moving.

He then says that the Japanese war has certainly shown that cavalry must be taught to shoot, but it merely discourages the men to demand an impossibly high standard from them. If the authorities insist on the cavalry shooting as well as the infantry, it will mean a loss of efficiency in their proper rôle. They ought, however to encourage shooting among officers and give liberal prizes for proficiency in shooting, judging distance and range taking. For rifle shooting there ought to be collective prizes for all units, from troops up to corps.

GERMAN PAPERS.*Militär Wochenblatt.*

Among the January and February issues of the above journal, the following articles of general interest are selected for special notice:—

1. "*French views regarding the supplementing of cavalry divisions by infantry cyclists and infantry on foot.*"

The article deals with the proposals of military authorities in France regarding the methods to be adopted for removing, as far as possible, the great disparity in strength which admittedly exists between the French and German cavalry. The inferior strength of the French cavalry has given rise to a problem which is no less applicable to ourselves, and it is therefore perhaps worth studying how our nearest continental neighbours propose to deal with the difficulty.

The conditions, briefly, are these: Germany has a numerical superiority of 102 cavalry regiments as against 79 in France. The former are uniformly armed with the lance, while the latter consist of heavy and light cavalry armed with the sword.

The French consider the most effective means of successfully meeting German cavalry to consist in providing the whole of their heavy cavalry with cuirasses. In cavalry combats it is apparently only the heavy cavalry who are considered a match for or even superior to German lancers. Accordingly, as a preliminary step towards increasing the fighting power of the cavalry as a whole, the cavalry divisions have been re-organised so as to distribute brigades of heavy cavalry among six out of the total of eight divisions, instead of having four heavy and four light divisions as formerly. Further, to increase the strength of the cavalry two machine-guns are to be allotted to each division. The machine-guns are mounted on carriages, each drawn by four horses, so as to secure extreme mobility, and to enable them to follow their divisions over any ground.

The re-organization of the cavalry divisions, and the employment of machine-guns are, however, by no means considered sufficient, and the French have been constantly striving to find additional means of increasing the fighting capacity of their cavalry. With this object, proposals have been made to supplement the cavalry divisions with bodies of infantry cyclists and infantry on foot. The infantry cyclists (companies or battalions) will form a fixed complement in each cavalry division, and owing to their great mobility will be able to follow the cavalry even when off the regular roads, as

which the sighting arrangements could be mounted clear of the shock of recoil, finally decided the introduction of telescopes. The line of sight being in the interior of the telescope itself, it was found that by adding a graduated horizontal plate to the instrument (the goniometer), it was possible to use the telescope not only for direct frontal laying but also for laying on auxiliary points to a flank or to the rear.

But it soon appeared that many inconveniences attended the use of this movable telescopic sight. The layer had to leave his place, and move to the other side of the gun, when laying to a flank; the shield obstructed the field of view, even though pierced with an embrasure etc., etc. The solution of the problem lay in the panoramic sight.

In this instrument a system of prisms enables the objective to be turned in any direction, or elevated above the shield while the eye-piece remains stationary. The result is that a line of sight in any direction can be used without any inconvenience to the layer.

A number of the Great Powers are said to have adopted this sight (U. S. A., Italy, Austria, Russia, Belgium, Roumania, Sweden, Turkey, Greece and Spain).

The article then gives a description of the instrument, which may be briefly summarised. The sight consists roughly of a steel upright cylinder. The upper part contains the objective, and is free to revolve in any direction. A prism in this part carries the optical line down the cylinder through various prisms and lenses to the eye-piece, which is rigidly fixed at the bottom. The most careful arrangements are made to ensure that all parts of the instrument are dust-proof and strong.

The advantages of the system are evident. The article closes with a detailed description of the method of using the instrument with the several arrangements for deflection, etc., etc.

The April number is unusually interesting. It commences with an article on "The Aims of Instruction."

It appears that after the passing of the new military law the Swiss Federal Military Department issued a circular defining the ends and aims of training and instruction, and laying down the means by which these should be attained.

The circular opens with the principles on which training should rest; that war is the rudest test of a nation's energy; and only that nation, which possesses a vigorous populace penetrated with patriotic principle, and a State with solid foundations, suitable to the needs of the nation, can hope to be successful in such a trial; the character of the nation is its strength. The army is the national guardian of independence. To be so, the army must have its roots in the people; it must draw from them its strength and its reward. The people and the army must in fact be one.

Starting from these premises the circular then proceeds to define the objects of training. These are three:—

First, to awaken and cultivate the love of service and confidence in our (Swiss) military institutions.

manner in which it has been proposed to utilise them in France may serve to elucidate a problem which is applicable to our own army when the disparity in the numbers of cavalry is even greater than that between France and Germany.

2. "*Experiences of the Japanese with machine-guns.*"

This article gives several instructive examples of the way in which the Japanese made use of machine guns during the late war and the lessons to be derived from their experiences. The following were some of the principal points noted:—

- (1) It was established that the moral effect of machine-gun fire within a radius of 1,500 yards was greater even than that of artillery. This is attributed to the fact that with artillery there is an appreciable interval between the moment of discharge and the impact of each shot which gives the defenders time to take cover. On the other hand, the uninterrupted hail of bullets from machine-guns allows of no such respite, and forces the defenders to keep continuously under cover.
- (2) The effect of machine-gun fire is usually regarded as equivalent to that of a company of infantry. In reality it is greater as owing to the steady platform and the sense of security afforded by a shield the firer can direct his fire with greater coolness and accuracy than when firing with the ordinary rifle.
- (3) Long range fire should as a rule be avoided. Fire to be really effective should be delivered within a range of 1,000 yards. Only in exceptional circumstances where a particularly favourable target presents itself, such as artillery in motion or close bodies of infantry, is it advisable to fire at distant ranges.
- (4) To judge of fire effect by observing the impact of the bullets is often impossible, but in such cases the behaviour of the enemy is usually a sufficient indication. Even troops of approved courage, when exposed to machine-gun fire, will show unmistakeable signs of its effect.
- (5) Firing by night is difficult not only because of the impossibility of taking aim, but because of the difficulty of loading in the dark. To obviate the latter difficulty a small electric lamp placed close to the breech and concealed from the enemy by the shield was found to be of the greatest advantage, and, in fact, indispensable. To secure as effective an aim, as possible, the elevation must be adjusted by day so as to fire horizontally.
- (6) A sufficient supply of ammunition is of vital importance. Experience teaches that nothing tends to greater waste than firing at distant ranges. Moreover, it entails the danger of being left with insufficient

A short survey of the new French Artillery Regulations follows. It appears that some interesting information is given as to the weight of the new equipment. The gun in battery weighs 1,140 *kg.*; limbered up (with three gunners) the figure is about normal, 2,100 *kg.*; but the wagon limbered up runs to 2,500 *kg.*, a high figure; the common shell is much lighter than the shrapnel.

The horse batteries have now received the 75 *mm.* equipment like the field. The grouping of the corps artillery under a single commander has disappeared, foreshadowing the distribution of batteries to divisions.

The rules for firing have not been altered. This, after six years' practice, is a remarkable tribute to the original framing of the rules.

General von Rohne compares this last fact with the German rules for ranging, to the disadvantage of the latter. The German system occupies far too much time, and moreover varies according as the target is fleeting or otherwise. This the distinguished officer holds to be wrong in principle. He proposes a remedy in the direction of independent action by batteries.

The number closes with an instructive survey of the question of the "*Utilisation of Dogs to search for the Wounded.*"

In the modern battlefield the difficulties of finding the wounded, always considerable owing to the natural inclination of the weakened man to drag himself into fancied security in any out-of-the-way corner, are increased by the enormous extent of the ground covered by the troops, and by the fact that with the intensity of the rifle and gun fire it is practically impossible for the medical assistance to move about in daylight.

In these circumstances, the idea of having recourse to the scenting powers of dogs has been much in favour for some years past. The first experiments were conducted in Germany, and the results were so encouraging that the system was given a thorough trial. Representatives of most of the Great Powers were present at different times at the trials.

In actual warfare the Russo-Japanese campaign has furnished an example of success with which dogs can be employed for these purposes. It is stated that at the Sha-Ho three dogs sent out by the German Association scented out 23 wounded, who had been abandoned. It was remarked, however, that these dogs, which had been trained with Europeans, were useless in the search for Japanese wounded.

Last January a competition was held, under the auspices of a Society founded in France, for the trial of these dogs. The dog was expected to search the ground for some 150 to 200 *m.* and to find the wounded man in the shortest time; to signal the find by barking or by returning to its master and barking, or by bringing back the man's cap, etc.; lastly to lead its master to the wounded man.

The greatest difficulty lies, not in finding the man, but in giving information thereof. Barking on arrival at the man is deprecated in many quarters. The bark may not be heard by the dog's master

and on the other hand may be heard by the enemy. For the dog to return to its master seems the system considered most suitable.

A discussion on the most suitable breed of dog and its equipment closes the article. Hitherto it appears that the German sheep-dog has been the favourite. For equipment the dog carries a packet of bandages, etc., sometimes a biscuit ration and a lantern, and always a coat with the German Cross.

The real advantages of the employment of dogs having now been proved, it only remains to organise the system on a proper basis.

fire effect, and they are not suited for fighting at close quarters. Consequently, they must endeavour to aid the further advance of the troops without quitting the positions they have already reached.

The attacking artillery directs its fire principally against the main works of the enemy, but partly also against the trenches lying between the above, in order to smother the enemy's fire and thus prepare for the assault. This object is, however, not usually easy to accomplish if the enemy is strongly entrenched. Consequently, machine-guns must direct their closer and more accurate fire at the enemy wherever they may show themselves, and must endeavour to sweep their trenches in such a manner as to prevent them showing their heads above cover.

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advantages of the 4-gun battery for field artillery, and is in favour of a 2-gun organization with a liberal allowance of ammunition for heavy artillery.

On this General Rohne notes that if the French army corps is given 36 batteries of 4 guns it will be far better off than the German corps with 24 batteries of 6 guns. The whole question turns on the extended fronts. The larger the number of guns the larger the front required, and if this is not available numerical superiority will not always be an advantage.

In regard to the time taken in deployments General Rohne does not admit the excessive advantage usually claimed for the Germans, and points out that once in action the French batteries have 1,248 rounds at disposal, against 780 for the German. Allowing $1\frac{1}{2}$ to 2 hours for the light ammunition columns to come up, this means rates of fire of 9—11 and 6—7 rounds per minute respectively.

The General then proceeds to examine certain of General Langlois' arguments. The latter laments that the desire for high velocities has resulted in the French gun being too heavy, and in this General Rohne agrees.

But General Langlois contends that it has been argued that a 4-gun battery gives as good results as a 6-gun battery, and therefore 4 guns are as good as or better than 6; and that the 23 batteries of an army corps are sufficient. These theories he considers are not supported by the practical experience of the Russo-Japanese war, and as a proof thereof the Japanese have retained their 6-gun batteries.

General Rohne does not admit ever having stated that a 4-gun battery is as good as a 6-gun. But inasmuch as the rate of fire is regulated by the rate of observation, he considers that the 4-gun battery gives the same number of rounds as the 6-gun in the same time, and by a calculation proves that 25 batteries of 4-guns in line are equal to 20 of 6 guns opposed to them. He supports these theories by quoting some experiments in Holland, in which the 4-gun battery proved well able to fire as many rounds in a given time as the 6-gun.

The French *Chef d'escadron* Aubrat argues that the French 92 guns are sufficient, in that one 4-gun battery should be able to cover a 400 metre front. He even proceeds to recommend the 3-gun battery. The task of the artillery will, he considers, be two-fold; first to bring fire to bear upon small targets which appear suddenly and for a short time, and secondly to search ground occupied by the enemy for a prolonged period. For these tasks "instantaneous" *tir instantané* and "overwhelming fire" *tir de neutralisation* respectively are required. For both orders of fire the 3-gun battery is preferable to either the 4 or 6-gun. And it is said that the majority of French battery commanders share the opinion.

Regulation for Practice in the German Field Artillery.

The new training regulations lay down two principles:—

1. Q.-F. artillery increases its effect when its action is unexpected.

2. The best method of making use of the great rapidity of fire is the *rafale*, that is, sudden, short and violent fire. This is the best to facilitate the advance of the friendly infantry.

These should be the basis of all artillery training, and the fact is observed in the next training regulations. But this is not the case in the new practice regulations, and accordingly General Rohne criticises the latter severely. The two main counts of the indictment are that too large a proportion of old matter is retained in the book (an inappropriate arrangement when it is a question of an entirely new equipment), and that too much attention is paid to detail. The critic also notices the influence of the alleged inferior sighting arrangement of the German gun. There is no independent line of sight, or panoramic sight. This affects the regulations. As an example of the excess of detail, it is observed that the rules for ranging inculcate the use of small corrections and occupy two whole pages, whereas in the French regulations the subject is efficiently treated in five or six lines.

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The Austrian theory is that one machine-gun is equivalent in fire-power to a section of infantry; whereas the Japanese say a whole company. Experiments have shown that a section at 800 yards will annihilate a machine-gun detachment of 5 men. But the analogy does not hold good with the longer ranges of war. The facts of actual warfare go to prove that the machine-gun is an extremely powerful weapon, and its effect is most demoralising.

The importance of the machine-gun is recognised to a somewhat exaggerated extent in some quarters. The *Armeezeitung* would give 10 to each infantry company; and to provide a set off to the expense, this writer proposes to reduce the strength in men. *Streffleurs* on the other hand holds that two is the maximum number of maxims that can safely be "massed" together. The shields, etc., form too conspicuous an object if there are more.

Again the difficulties of ammunition supply if the number of machine-guns with a unit is multiplied should not be forgotten.

As regards cavalry, however, the necessity for providing guns for isolated brigades practically limits the size of the machine-gun unit to 4 guns.

Thus the Austrian figure of 2 per infantry and 4 per cavalry unit is justified.

An infantry machine-gun detachment (*sub-division*) is said to have 2 officers, 27 men and 12 horses, while the cavalry figures are 3, 60 and 60 respectively.

The gun is the Schwarzlose 7 mm. pattern. This is considered to be of simpler construction than the maxim, more accurate and lighter.

The same writer gives some curious details of the rules governing the marriage of officers in various armies. In Russia no officer may marry till his pay and private means together reach the figure of 1,200 *roubles*; Italy requires 4,000 *lires*; Germany about 2,500 *marks*. Austria demands guarantees of 60,000, 50,000, 40,000 and 30,000 crowns from lieutenants and 1st lieutenants, captains and majors respectively, and in addition limits the number of married officers to 50 per cent of the total.

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The author notes that for mountain troops it is not enough to draw the recruits from the mountains; a regular training in mountain warfare is necessary. One regiment, which was recruited from the mountains but had had no training therein, failed in many ways to make the best of its opportunities. Much time and labour was wasted; there was a lack of initiative, shown more particularly by the failure to maintain touch with the enemy; and lastly the strength of the men was over-taxed, although their excellent physique prevented any harmful results. On the other hand a detachment from the training school at St. Maurice showed what can be effected by proper instruction.

The absence of mountain artillery was very noticeable. This arm should always be represented in mountain exercises.

Speaking generally the author holds that it is very risky to propose to employ troops in mountain work in war, if they have not been regularly and specially trained in peace. It is particularly desirable that the instruction should be regular, and not intermittent.

All mountain troops should be recruited from the mountains. A certain number of picked battalions should be detailed for the mountain fortresses. These in a few years will become expert in

the work. Special courses for officers are recommended. Battalions should control and train their own baggage animals for the special duties.

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The author starts with the postulate that it is not always possible to outflank a fortified position; surprise is the exception, not the rule; the attack by main strength requires the systematic co-operation of the three arms.

The *artillery* of the attack should be composed chiefly of howitzers, with a proportion of guns for long-range enfilade. The howitzers should be a heavy type, 10 to 12 *cm.*, with a detonating shell and a light 95 *mm.* type, with a 10 *kg.* detonating shell, and a few shrapnel for special cases. The attacking artillery usually has the advantage of being able to utilise cover, whereas that of the defence will often be obliged to come into the open. The attack must not only reduce the defending guns to silence but also keep them under fire during the assault.

The assault is usually delivered on a zone, rather than at a point. This zone must be kept under fire, and, if possible, be enfiladed. The strength of the defence lies in rifle and machine gun fire.

The attacking artillery should maintain observing stations in the infantry firing line, which should be connected to the batteries by telephone, etc. This enables fire to be prolonged, but at the last moment when the infantry are most in need of support, it becomes difficult to use even howitzers without effecting the advancing lines. At this point a light mortar is required. This piece would be placed in the firing line itself, and would reach the enemy behind his parapets. Calibre 95 *mm.*, maximum range one *kilometre*, and a torpedo shell. The mortars would be attached to infantry units, in pairs, like machine-guns.

The *engineers* should be carefully exercised in the attack of fortifications; but the *infantry* should also be trained in this work.

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which the sighting arrangements could be mounted clear of the shock of recoil, finally decided the introduction of telescopes. The line of sight being in the interior of the telescope itself, it was found that by adding a graduated horizontal plate to the instrument (the goniometer), it was possible to use the telescope not only for direct frontal laying but also for laying on auxiliary points to a flank or to the rear.

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A number of the Great Powers are said to have adopted this sight (U. S. A., Italy, Austria, Russia, Belgium, Roumania, Sweden, Turkey, Greece and Spain).

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The advantages of the system are evident. The article closes with a detailed description of the method of using the instrument with the several arrangements for deflection, etc., etc.

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It appears that after the passing of the new military law the Swiss Federal Military Department issued a circular defining the ends and aims of training and instruction, and laying down the means by which these should be attained.

The circular opens with the principles on which training should rest; that war is the rudest test of a nation's energy; and only that nation, which possesses a vigorous populace penetrated with patriotic principle, and a State with solid foundations, suitable to the needs of the nation, can hope to be successful in such a trial; the character of the nation is its strength. The army is the national guardian of independence. To be so, the army must have its roots in the people; it must draw from them its strength and its reward. The people and the army must in fact be one.

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Lastly, the periodical trainings (*cours de répétition*) of troops are noticed, and stress is laid on the fact that these should be utilised for manœuvres and not for elementary drills.

The artillery discussion (*Dans l'Artillerie*) is resumed with a comparison (largely indebted to General von Rohne) of the French and German strengths.

The fear that the 92 guns of the French army corps are insufficient to cope with the German 144 arises from two sources—the modern extended fronts, and the two years' service in the infantry (it was a principle of Napoleon that the weaker the infantry, the stronger an army's artillery should be).

The proposed reorganisation of the French artillery will have the effect of increasing the total of batteries—horse, field, and mountain—from 511 to 796, together with the substitution of heavy field guns for light in certain cases. On the other hand, the foot artillery is to be reduced from 112 to 97 batteries. With the help of the reduced foot batteries, and the conversion of 36 of the present horse batteries into 54 field batteries; by an augmentation of some 5,000 men; by abolishing the artillery bands; and by reducing the peace strength of field batteries, it is proposed to find the personnel for this large increase.

But, even so, the German artillery with 3,498 guns has a decided superiority over the French total of 3,184, and in addition each German army corps has 16 heavy howitzers.

General Rohne insists, however, on the advantages of the 4-gun battery, and would reorganise the German artillery on that basis.

A note on the use of *artillery patrols* comes to the conclusion that the personnel of batteries are more required in the firing line than in front, and recommends the use of cavalry for patrols as a general rule.

A short survey of the new French Artillery Regulations follows. It appears that some interesting information is given as to the weight of the new equipment. The gun in battery weighs 1,140 *kg.*; limbered up (with three gunners) the figure is about normal, 2,100 *kg.*; but the wagon limbered up runs to 2,500 *kg.*, a high figure; the common shell is much lighter than the shrapnel.

The horse batteries have now received the 75 *mm.* equipment like the field. The grouping of the corps artillery under a single commander has disappeared, foreshadowing the distribution of batteries to divisions.

The rules for firing have not been altered. This, after six years' practice, is a remarkable tribute to the original framing of the rules.

General von Rohne compares this last fact with the German rules for ranging, to the disadvantage of the latter. The German system occupies far too much time, and moreover varies according as the target is fleeting or otherwise. This the distinguished officer holds to be wrong in principle. He proposes a remedy in the direction of independent action by batteries.

The number closes with an instructive survey of the question of the "*Utilisation of Dogs to search for the Wounded.*"

In the modern battlefield the difficulties of finding the wounded, always considerable owing to the natural inclination of the weakened man to drag himself into fancied security in any out-of-the-way corner, are increased by the enormous extent of the ground covered by the troops, and by the fact that with the intensity of the rifle and gun fire it is practically impossible for the medical assistance to move about in daylight.

In these circumstances, the idea of having recourse to the scenting powers of dogs has been much in favour for some years past. The first experiments were conducted in Germany, and the results were so encouraging that the system was given a thorough trial. Representatives of most of the Great Powers were present at different times at the trials.

In actual warfare the Russo-Japanese campaign has furnished an example of success with which dogs can be employed for these purposes. It is stated that at the Sha-Ho three dogs sent out by the German Association scented out 23 wounded, who had been abandoned. It was remarked, however, that these dogs, which had been trained with Europeans, were useless in the search for Japanese wounded.

Last January a competition was held, under the auspices of a Society founded in France, for the trial of these dogs. The dog was expected to search the ground for some 150 to 200 *m.* and to find the wounded man in the shortest time; to signal the find by barking or by returning to its master and barking, or by bringing back the man's cap, etc.; lastly to lead its master to the wounded man.

The greatest difficulty lies, not in finding the man, but in giving information thereof. Barking on arrival at the man is deprecated in many quarters. The bark may not be heard by the dog's master

and on the other hand may be heard by the enemy. For the dog to return to its master seems the system considered most suitable.

A discussion on the most suitable breed of dog and its equipment closes the article. Hitherto it appears that the German sheep-dog has been the favourite. For equipment the dog carries a packet of bandages, etc., sometimes a biscuit ration and a lantern, and always a coat with the German Cross.

The real advantages of the employment of dogs having now been proved, it only remains to organise the system on a proper basis.

fire effect, and they are not suited for fighting at close quarters. Consequently, they must endeavour to aid the further advance of the troops without quitting the positions they have already reached.

The attacking artillery directs its fire principally against the main works of the enemy, but partly also against the trenches lying between the above, in order to smother the enemy's fire and thus prepare for the assault. This object is, however, not usually easy to accomplish if the enemy is strongly entrenched. Consequently, machine-guns must direct their closer and more accurate fire at the enemy wherever they may show themselves, and must endeavour to sweep their trenches in such a manner as to prevent them showing their heads above cover.

The assault is delivered simultaneously against both the main work and the adjacent trenches and batteries in the enemy's line. While this is taking place, the machine-guns continue to give support by covering fire, but a few may be sent on with the troops delivering the assault, in order to be in position for firing during the pursuit. Should the covering fire become dangerous to their own troops the machine-guns must at once hurry forward, and will be employed either in repelling attempts at counter-attack or in aiding the attack on adjacent works in the enemy's line. The machine-guns with the reserve are also sent forward to be employed as may be necessary.

When in this position, it is of particular importance to attack all supporting defence works in the vicinity without delay; otherwise, the troops penetrating the enemy's defences may find themselves compelled to form front on three sides, and if they are thus forced back, their giving ground may easily result in the whole attack proving a failure. To prevent this the utmost fighting capacity of the machine-guns must be employed, and their fire concentrated against decisive points so as to give the strongest support possible which must be sustained at all costs. The machine-gun detachment should be thoroughly conscious that their withdrawal at this critical period would spell disaster.

Several instructive examples which are well worth studying are given in the article to illustrate the principles for employing machine-guns as above enunciated, but space forbids the quoting of any of these in detail.

FRENCH PAPERS.*Revue Militaire Suisse.*

The February number has an important article on the main artillery questions of the day *Dans l'Artillerie* which consists of opinions culled from current military literature. The first item is—

The Field Howitzer.

An article in the *Artilleristische Monatsheft* reviews three books by partisans of this weapon.

The first author, Major-General von Bahn, pronounces against shrapnel, pointing out that it is impossible to touch troops behind modern field works. He is in favour of a time and percussion fuze for the common shell. The calibre should be between 10 and 12 *cm.* for the 20 *kg.* projectile; the latter calibre gives the maximum permissible weight in field artillery. The author has no illusions as to the number of hits, but considers isolated rounds will have good effect.

The second author, Captain Roskoten, is of opinion (and in this General von Rohne supports him) that howitzers should be used in batteries of 4, and that 6 such 4-howitzer batteries should be attached to the artillery of an army corps (not to the division). He confines the employment of howitzers to fire against troops under cover, and the preparation of breaches, and would not use them for the artillery combat. All howitzers of the several army corps in action should be concentrated, and work together. They would assist the field guns in firing on the points of attack and employ shrapnel when the enemy occupied his works.

The third, Engineer of Artillery Kahn, would employ his howitzers against the same targets as field guns, especially troops behind ridges. For the attack of field works he recommends a special weapon. Thus he proposes a light Q.-F. field howitzer, with an 8 *kg.* shrapnel and a 10 *kg.* shell, with respective initial velocities of 330 and 300 *m.*; and a heavy howitzer of 15 *cm.*

The diversity of opinion on this subject is increased by the fact that such authorities as the French General Langolis are opposed to the introduction of the field howitzer in any form.

Increase of Field Artillery in France.—Comparison between French and German Artillery.—French Artillery Questions

These are articles by General Rohne in the same magazine.

The French war budget for 1907 shows that the French army corps has only 92 guns against the German 144, and the proportion for 1,000 rifles is smaller in France than elsewhere; the late war in the Far East is quoted to show the importance of artillery, and an increase of 800 to 1,000 guns is proposed. Also the report shows the

advantages of the 4-gun battery for field artillery, and is in favour of a 2-gun organization with a liberal allowance of ammunition for heavy artillery.

On this General Rohne notes that if the French army corps is given 36 batteries of 4 guns it will be far better off than the German corps with 24 batteries of 6 guns. The whole question turns on the extended fronts. The larger the number of guns the larger the front required, and if this is not available numerical superiority will not always be an advantage.

In regard to the time taken in deployments General Rohne does not admit the excessive advantage usually claimed for the Germans, and points out that once in action the French batteries have 1,248 rounds at disposal, against 780 for the German. Allowing $1\frac{1}{2}$ to 2 hours for the light ammunition columns to come up, this means rates of fire of 9-11 and 6-7 rounds per minute respectively.

The General then proceeds to examine certain of General Langlois' arguments. The latter laments that the desire for high velocities has resulted in the French gun being too heavy, and in this General Rohne agrees.

But General Langlois contends that it has been argued that a 4-gun battery gives as good results as a 6-gun battery, and therefore 4 guns are as good as or better than 6, and that the 24 batteries of an army corps are sufficient. These theories he considers are not supported by the practical experience of the Russo-Japanese war, and as a proof thereof the Japanese have retained their 6-gun batteries.

General Rohne does not admit ever having stated that a 4-gun battery is as good as a 6-gun. But inasmuch as the rate of fire is regulated by the rate of observation, he considers that the 4-gun battery gives the same number of rounds as the 6-gun in the same time, and by a calculation proves that 25 batteries of 4 guns in line are equal to 20 of 6 guns opposed to them. He supports these theories by quoting some experiments in Holland in which the 4-gun battery proved well able to fire as many rounds in a given time as the 6-gun.

The French *Chef de bataillon* Aubert argues that the French 92 guns are sufficient in that one 4-gun battery should be able to cover a 400-metre front. He even proceeds to recommend the 3-gun battery. The task of the artillery will, he considers, be two fold, first to bring fire to bear upon small targets which appear suddenly and for a short time, and secondly to search ground occupied by the enemy for a prolonged period. For these tasks "instantaneous" for *instantane* and "overwhelming fire" for *de neutralisation* respectively are required. For both or less of fire the 3-gun battery is preferable to either the 4 or 6-gun. And it is said that the majority of French battery commanders share the opinion.

Replique to the Pontier on the German Field Artillery

The new training regulations lay down two principles:—

1. Q. F. Artillery increases its effect when its action is unexpected.

2. The best method of making use of the great rapidity of fire is the *rufale*, that is, sudden, short and violent fire. This is the best to facilitate the advance of the friendly infantry.

These should be the basis of all artillery training, and the fact is observed in the next training regulations. But this is not the case in the new practice regulations, and accordingly General Rohne criticises the latter severely. The two main counts of the indictment are that too large a proportion of old matter is retained in the book (an inappropriate arrangement when it is a question of an entirely new equipment), and that too much attention is paid to detail. The critic also notices the influence of the alleged inferior sighting arrangement of the German gun. There is no independent line of sight, or panoramic sight. This affects the regulations. As an example of the excess of detail, it is observed that the rules for ranging inculcate the use of small corrections and occupy two whole pages, whereas in the French regulations the subject is efficiently treated in five or six lines.

The article closes with a consideration of the new organisation of the artillery in the English army. It shows that the largest unit is the "group" of two or three batteries, and discusses the object of this arrangement. The conclusion arrived at is that the organisation is extremely supple and elastic, and well suited to the new conditions of extended fronts. With the group system the divisional artillery of two or three groups can be split up, and attached to brigades as required.

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In these circumstances the idea of having recourse to the searching powers of dogs has been much in favour for some years past. The first experiments were conducted in Germany and the results were so encouraging that the system was given a thorough trial. Representatives of most of the Great Powers were present at different times at the trials.

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advantages of the 4-gun battery for field artillery, and is in favour of a 2-gun organization with a liberal allowance of ammunition for heavy artillery.

On this General Rohne notes that if the French army corps is given 36 batteries of 4 guns it will be far better off than the German corps with 24 batteries of 6 guns. The whole question turns on the extended fronts. The larger the number of guns the larger the front required, and if this is not available numerical superiority will not always be an advantage.

In regard to the time taken in deployments General Rohne does not admit the excessive advantage usually claimed for the Germans, and points out that once in action the French batteries have 1248 rounds at disposal, against 780 for the German. Allowing 1½ to 2 hours for the light ammunition columns to come up, this means rates of fire of 9-11 and 6-7 rounds per minute respectively.

The General then proceeds to examine certain of General Langlois' arguments. The latter laments that the desire for high velocities has resulted in the French gun being too heavy, and in this General Rohne agrees.

But General Langlois contends that it has been argued that a 4-gun battery gives as good results as a 6-gun battery, and therefore 4 guns are as good as or better than 6; and that the 24 batteries of an army corps are sufficient. These theories he considers are not supported by the practical experience of the Russo-Japanese war, and as a proof thereof the Japanese have retained their 6-gun batteries.

General Rohne does not admit ever having stated that a 4-gun battery is as good as a 6-gun. But inasmuch as the rate of fire is regulated by the rate of observation, he considers that the 4-gun battery gives the same number of rounds as the 6-gun in the same time, and by a calculation proves that 25 batteries of 4 guns in line are equal to 20 of 6 guns opposed to them. He supports these theories by quoting some experiments in Holland, in which the 4-gun battery proved well able to fire as many rounds in a given time as the 6-gun.

The French *Chef de escadron* Aubrat argues that the French 92 guns are sufficient, in that one 4-gun battery should be able to cover a 400-metre front. He even proceeds to recommend the 3-gun battery. The task of the artillery will, he considers, be twofold, first to bring fire to bear upon small targets which appear suddenly and for a short time, and secondly to search ground occupied by the enemy for a prolonged period. For these tasks "instantaneous fire" and "overwhelming fire" for *denuded position* respectively are required. For both orders of fire the 3-gun battery is preferable to either the 4 or 6-gun. And it is said that the majority of French battery commanders share the opinion.

Repetition for Protection of the German Field Artillery.

The new training regulations lay down two principles:—

1. Q. F. artillery increases its effect when its action is unexpected.

2. The best method of making use of the great rapidity of fire is the *rafale*, that is, sudden, short and violent fire. This is the best to facilitate the advance of the friendly infantry.

These should be the basis of all artillery training, and the fact is observed in the next training regulations. But this is not the case in the new practice regulations, and accordingly General Rohne criticises the latter severely. The two main counts of the indictment are that too large a proportion of old matter is retained in the book (an inappropriate arrangement when it is a question of an entirely new equipment), and that too much attention is paid to detail. The critic also notices the influence of the alleged inferior sighting arrangement of the German gun. There is no independent line of sight, or panoramic sight. This affects the regulations. As an example of the excess of detail, it is observed that the rules for ranging inculcate the use of small corrections and occupy two whole pages, whereas in the French regulations the subject is efficiently treated in five or six lines.

The article closes with a consideration of the new organisation of the artillery in the English army. It shows that the largest unit is the "group" of two or three batteries, and discusses the object of this arrangement. The conclusion arrived at is that the organisation is extremely supple and elastic, and well suited to the new conditions of extended fronts. With the group system the divisional artillery of two or three groups can be split up, and attached to brigades as required.

The Austrian correspondent has some useful notes in this number on the vexed question of the use of machine-guns. He quotes a paragraph from *Streiffleurs Militärische Zeitschrift* which lays down that with the extended fronts of the modern battle it is desirable that machine-guns should be attached to regiments of infantry in order that their fire may be dispersed as required; but that in the cavalry such an arrangement would introduce numerous complications and therefore, on the whole, it is preferable for machine-guns to be organised in separate units.

The Austrian theory is that one machine-gun is equivalent in fire-power to a section of infantry; whereas the Japanese say a whole company. Experiments have shown that a section at 800 yards will annihilate a machine-gun detachment of 5 men. But the analogy does not hold good with the longer ranges of war. The facts of actual warfare go to prove that the machine-gun is an extremely powerful weapon, and its effect is most demoralising.

The importance of the machine-gun is recognised to a somewhat exaggerated extent in some quarters. The *Armeezeitung* would give 10 to each infantry company; and to provide a set off to the expense, this writer proposes to reduce the strength in men. *Streiffleurs* on the other hand holds that two is the maximum number of maxims that can safely be "massed" together. The shields, etc., form too conspicuous an object if there are more.

Again the difficulties of ammunition supply if the number of machine-guns with a unit is multiplied should not be forgotten.

As regards cavalry, however, the necessity for providing guns for isolated brigades practically limits the size of the machine gun unit to 4 guns.

Thus the Austrian figure of 2 per infantry and 4 per cavalry unit is justified.

An infantry machine gun detachment (*maschinengewehrtrupp*) is said to have 2 officers, 27 men and 12 horses, while the cavalry figures are 3, 60 and 60 respectively.

The gun is the Schwarzlose 7 mm. pattern. This is considered to be of simpler construction than the maxim, more accurate and lighter.

The same writer gives some curious details of the rules governing the marriage of officers in various armies. In Russia no officer may marry till his pay and private means together reach the figure of 1,200 *roubles*. Italy requires 4,000 *lire*s, Germany about 2,500 *marks*. Austria demands guarantees of 60,000, 50,000, 40,000 and 30,000 crowns from lieutenants and 1st lieutenants, captains and majors respectively and in addition limits the number of married officers to 50 per cent of the total.

Revue Militaire Suisse. March 1908.

This number commences with an instructive appreciation of some minor (Swiss) manoeuvres in the Lower Alps in 1907. The troops amounted to about three regiments only, the weather was fine all through, and the country not difficult, but even so the indications were sufficient to form the grounds of some definite conclusions.

The author notes that for mountain troops it is not enough to draw the recruits from the mountains; a regular training in mountain warfare is necessary. One regiment, which was recruited from the mountains, but had had no training therein, failed in many ways to make the best of its opportunities. Much time and effort was wasted, there was a lack of initiative, shown more particularly by the failure to maintain touch with the enemy, and, lastly, the strength of the men was overtaxed, although the recovery of pay prevented any harmful results. On the other hand, a detachment from the training school at St. Maurice showed what can be effected by proper instruction.

The descent of mountain artillery was very noticeable. This arm should always be represented in mountain exercises.

Speaking generally the author holds that it is very risky to propose to employ troops in mountain work in war if they have not been regularly and specially trained in peace. It is particularly desirable that the instruction should be regular and not intermittent.

All mountain troops should be recruited from the mountains. A certain number of peaked battalions should be detached to the mountain fortresses. These in a few years will become expert in

the work. Special courses for officers are recommended. Battalions should control and train their own baggage animals for the special duties.

The article closes with a detail of the rations issued during the manoeuvres which seems worthy of note. The invariable inclusion of *chocolate* in the ration is to be remarked. A detail of the *trains* is also given.

A short summary of an article in a German magazine which is given under the title of "*Attack of Fortified Positions*" is too interesting to be passed over without notice.

The author starts with the postulate that it is not always possible to outflank a fortified position; surprise is the exception, not the rule; the attack by main strength requires the systematic co-operation of the three arms.

The *artillery* of the attack should be composed chiefly of howitzers, with a proportion of guns for long-range enfilade. The howitzers should be a heavy type, 10 to 12 *cm.*, with a detonating shell and a light 95 *mm.* type, with a 10 *kg.* detonating shell, and a few shrapnel for special cases. The attacking artillery usually has the advantage of being able to utilise cover, whereas that of the defence will often be obliged to come into the open. The attack must not only reduce the defending guns to silence but also keep them under fire during the assault.

The assault is usually delivered on a zone, rather than at a point. This zone must be kept under fire, and, if possible, be enfiladed. The strength of the defence lies in rifle and machine gun fire.

The attacking artillery should maintain observing stations in the infantry firing line, which should be connected to the batteries by telephone, etc. This enables fire to be prolonged, but at the last moment when the infantry are most in need of support, it becomes difficult to use even howitzers without effecting the advancing lines. At this point a light mortar is required. This piece would be placed in the firing line itself, and would reach the enemy behind his parapets. Calibre 95 *mm.*, maximum range one *kilometre*, and a torpedo shell. The mortars would be attached to infantry units, in pairs, like machine-guns.

The *engineers* should be carefully exercised in the attack of fortifications; but the *infantry* should also be trained in this work.

The co-operation of the three arms, artillery, infantry and engineers, especially at the decisive moment, is of the utmost importance. The artillery support in the last phases is the great difficulty. Infantry should carry distinguishing marks on their backs to assist their own artillery in recognising friendly troops.

The same number has a very readable article on the Goertz panoramic telescope, used as a sight for artillery.

It is first explained how the increase in the range of guns led to a demand for a telescope to assist in laying on objects too distant for the unaided eye. The adoption of the cradle recoil system, by

which the sighting arrangements could be mounted clear of the shock of recoil, finally decided the introduction of telescopes. The line of sight being in the interior of the telescope itself, it was found that by adding a graduated horizontal plate to the instrument (the goniometer), it was possible to use the telescope not only for direct frontal laying but also for laying on auxiliary points to a flank or to the rear.

But it soon appeared that many inconveniences attended the use of this movable telescope sight. The layer had to leave his place and move to the other side of the gun, when laying to a flank, the shield obstructed the field of view, even though pierced with an embrasure etc. etc. The solution of the problem lay in the panoramic sight.

In this instrument a system of prisms enables the objective to be turned in any direction, or elevated above the shield while the eye-piece remains stationary. The result is that a line of sight in any direction can be used without any inconvenience to the layer.

A number of the Great Powers are said to have adopted this sight (U. S. A., Italy, Austria, Russia, Belgium, Roumania, Sweden, Turkey, Greece and Spain).

The article then gives a description of the instrument which may be briefly summarised. The sight consists roughly of a steel upright cylinder. The upper part contains the objective, and is free to revolve in any direction. A prism in this part carries the optical line down the cylinder through various prisms and lenses to the eye-piece, which is rigidly fixed at the bottom. The most careful arrangements are made to ensure that all parts of the instrument are dust-proof and strong.

The advantages of the system are evident. The article closes with a detailed description of the method of using the instrument with the several arrangements for deflection, etc. etc.

The April number is unusually interesting. It commences with an article on "The Arms of Instruction."

It appears that after the passing of the new military law the Swiss Federal Military Department issued a circular defining the ends and aims of training and instruction, and laying down the means by which these should be attained.

The circular opens with the principles on which training should rest, that war is the rudest test of a nation's energy, and only that nation which possesses a vigorous population, penetrated with patriotic principle, and a State with sound foundations, suitable to the needs of the nation can hope to be successful in such a trial; the character of the nation is its strength. The army is the national guardian of independence. To be so, the army must have its roots in the people, it must draw from them its strength and its reward. The people and the army must in fact be one.

Starting from these premises the circular then proceeds to define the objects of training. These are three —

First, to awaken and cultivate the love of service and discipline in our (Swiss) military institutions.

Secondly, to inculcate in superiors an authority, which will impose itself in all situations.

Thirdly, to instil in soldiers of all grades the sentiment of what they ought to know, and of what they are capable.

The circular then explains how these ends are to be attained. The officers are first dealt with. It is pointed out that everything depends first and last on *personal influence*. The officer's personal conduct, his language and his relations with his men, therefore find a prominent place in the instructions, and after this follows a note on the officer's professional and technical training.

A chapter is devoted to the non-commissioned ranks, showing forth how important a part these play in the education of the men. Instruction under the guidance of the officers and interior economy afford a wide field for the activities of the N.-C. O.; and in addition he should learn to command. Another chapter deals with the schools of instruction for officers, and their share in the training of the commissioned ranks; some attention is given to the formation of character.

Lastly, the periodical trainings (*cours de répétition*) of troops are noticed, and stress is laid on the fact that these should be utilised for manœuvres and not for elementary drills.

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